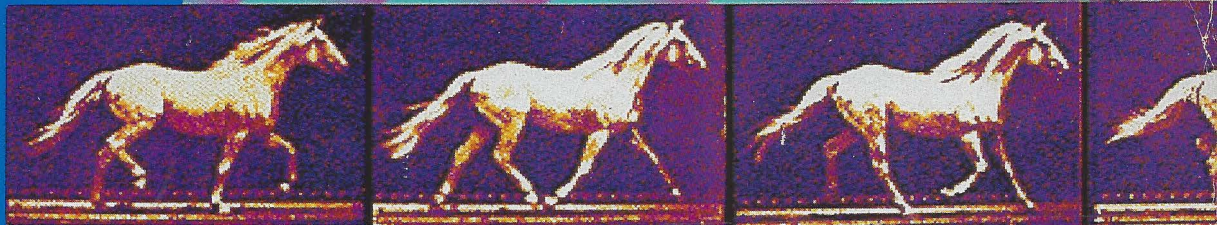
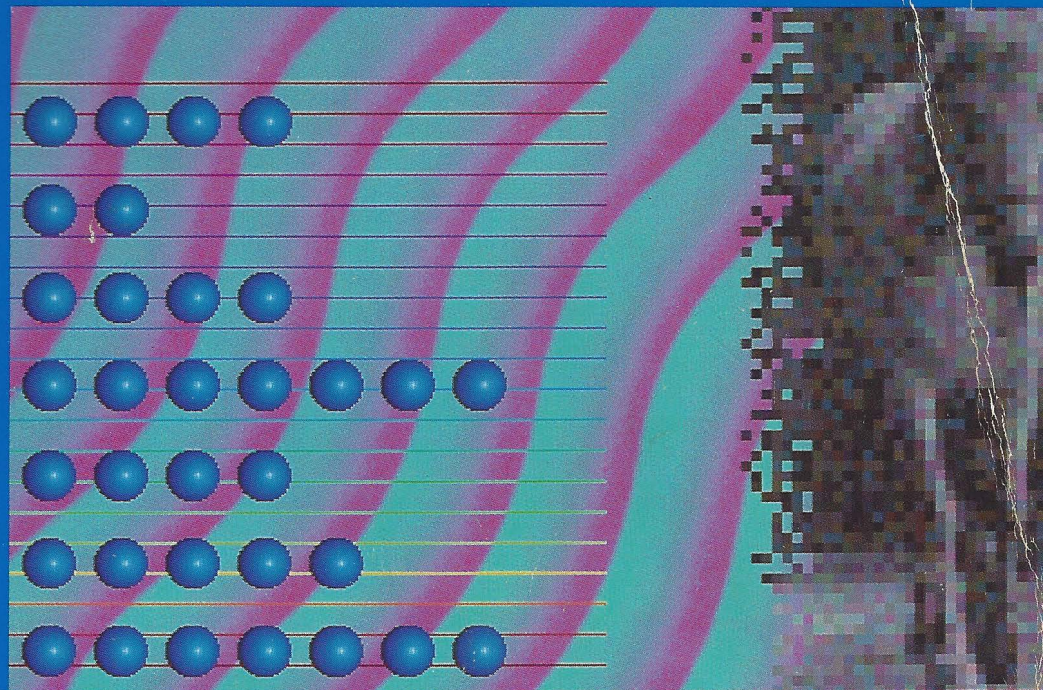


# INSIDE AUTODESK ANIMATOR™

Leah Freiwald and Lee Marrs



## The Complete Guide to Animation on a PC



New Riders Publishing

Optional Disk Available





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# Inside Autodesk Animator<sup>TM</sup>

*The Complete Guide to Animation on a PC*

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Leah Freiwald  
Lee Marrs



New Riders Publishing, Thousand Oaks, California

# **Inside Autodesk Animator™**

*The Complete Guide to Animation on a PC*

By Leah Freiwald and Lee Marrs

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Since the early 1980's, Leah Freiwald has been writing about computers and has developed numerous book-length tutorials for popular IBM, Apple, and Macintosh applications programs. Her company, Manual Dexterity, specializes in designing informational materials for CAD and computer graphics software. A delight in animation was sparked at Autodesk, Inc., where she was part of the software development group working on Autodesk Animator.

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# Table of Contents

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## ***Introduction***

What Is Inside Animator?	I-2
How Inside Animator Is Organized	I-4
Read This — It's Important	I-4
How to Use Inside Animator	I-4
Our Contributors	I-8

---

## **Chapter 1     *Setting Up a Studio***

Setting Up Animator	1-1
Starting Animator	1-3
Main Screen Menus	1-4
The Home Panel	1-7
Frames and Flics	1-15
Leaving Animator	1-18
Next Steps	1-21

---

## **Chapter 2     *What's My Project?***

Planning Ahead	2-1
Drawing a Layout	2-4
Editing the Layout	2-5
Testing Movement	2-9
Setting Up Files for a Project	2-15
Next Steps	2-19

---

**Chapter 3      *So Many Tools, Even More Inks***

The Drawing Tools Panel	3-1
Aligning Elements With a Grid	3-6
Placing Elements With Status Line Coordinates	3-8
The Text Tool	3-13
The Separate Tool	3-18
The Tweening Tools	3-20
The Ink Types Panel	3-28
Emboss Ink	3-32
The Gradient Inks	3-34
Next Steps	3-36

---

**Chapter 4      *Nearly Innumerable Colors***

Colors on the Home Panel	4-1
Changing the Current Color	4-2
Changing Key Color and Mini-Palette Colors	4-5
Selecting Colors on the Palette Panel	4-6
Adjusting RGB and HLS	4-10
Tinting	4-14
Sorting and Arranging Clusters	4-16
Color Cycling	4-20
Cutting and Pasting Colors	4-23
Next Steps	4-27

---

**Chapter 5      *Cel is for Selection***

Key Color and the Cel	5-2
Selecting a Cel	5-7
Moving and Pasting a Cel	5-9
Pasting a Cel Below Another Object	5-9



Moving a Cel on a Path	5-11
Selecting Cels From Multi-Colored Backgrounds	5-19
Next Steps	5-21

---

**Chapter 6**      ***Textual Exploits***

The Text Tool and the Titling Panel	6-1
Creating Text	6-4
Editing Text	6-6
Applying Text to a Flic	6-12
Text Files	6-13
Importing an ASCII File	6-14
Animating Text	6-15
Next Steps	6-21

---

**Chapter 7**      ***Segments Got Rhythm***

Analyzing Movements for a Flic	7-2
Setting Up Frames for a Segment	7-3
Creating a Grid	7-7
Creating a Write On	7-8
Using the Mask	7-14
Pacing and Timing	7-18
Changing Play Speed	7-20
Inserting and Deleting Frames	7-22
Inserting Multiple Copies	7-24
Creating a Pullback	7-27
Cleaning Up Frames	7-30
Doing a Reverse Optics Move	7-32
Creating the Title	7-39
Finishing Touches	7-43
Next Steps	7-45

---

**Chapter 8**      ***Classic Animation Cycles***

---

Drawing Cycles	8-2
Drawing Straight Ahead With NEXT BLUE	8-8
Drawing Key Poses and Inbetweens	8-14
Multiple Movements	8-18
Filling in the Outlines	8-22
Adjusting Timing	8-23
Recycling Characters	8-24
Recapping a Cycle	8-32
Other Examples	8-34
Next Steps	8-37

---

**Chapter 9**      ***Words Processed as Images***

---

The Animator Fonts	9-2
Entering and Adjusting the Text	9-5
Processing Text as an Image	9-9
Creating the Movement	9-11
Using a Macro to Color the Titles	9-15
Other Examples	9-20
Next Steps	9-23

---

**Chapter 10**      ***Colors on the Move***

---

Preparing and Masking the Silhouette	10-1
Setting Up the Palette for Color Cycling	10-4
Applying the Colors on Screen	10-6
Cycling the Colors	10-10
Placing the Couple on the Scene	10-11
Other Examples	10-15
Next Steps	10-17

---

**Chapter 11**     ***Metamorphoses***

---

Polymorphic Tweening	11-1
Polygons for Tweening	11-3
Blending Drawings With Start and End Polygons	11-7
Preparing Drawings for Tweening	11-7
Preparing Polygons	11-12
Tweening the Polygons	11-16
Blending the Drawing With the Tweening	11-20
Finishing Touches	11-21
Other Examples	11-21
Next Steps	11-23

---

**Chapter 12**     ***Optical Effects***

---

The Illusion of 3D	12-1
Planning Optical Effects	12-8
Flipping a Scene	12-9
Tennis Ball With Top Spin	12-14
Soaring Seagull	12-19
Other Examples	12-24
Next Steps	12-27

---

**Chapter 13**     ***Joining and Compositing***

---

Planning Ahead to Composite and Join Flics	13-2
Compositing the Exercise Cycle on the Beach Background	13-5
Expanding the Exercise Cycle With JOIN	13-9
Compositing the Other Exercisers With Underlay	13-11
Compositing the Seagull	13-16
Dividing a Flic Into Two Parts	13-18
Joining the Rainy City and the Beach With a Transition	13-19
Compositing the Sunset With a Cross-Fade	13-23

Compositing the Fantasy Sequence	13-25
Joining and Compositing the Titled Sequences	13-30
Finishing Touches	13-44
A Complete Version of the Club Baltic Animation	13-47
Other Examples	13-52

---

**Chapter 14    *Getting Presentable***

The Player Program	14-1
Making the AutoCAD Connection	14-10
Creating Frames for Animator With the Animation Tool Kit	14-13
Rendering the Frames in AutoShade	14-21
Making a Flic With Flimaker	14-24
Polishing 3D Animations in Animator	14-26
Presenting the 3D Truss Animation	14-29
Other Examples of Presentable Flics	14-30
What's Next?	14-35

---

**Appendix A    *File Formats and File Conversions***

Animator File Formats	A-1
Importing Files Into Animator	A-2
Scanning In Photographs	A-4
Capturing Video Images	A-4
Coordinating Music Files	A-5
Capturing Animator Screens	A-5

---

**Appendix B    *Animator and Videotape***

Designing Animations for Videotape	B-1
Videotape Formats	B-3
Laying Down Sound Tracks	B-3
Hardware for Dumping to Videotape	B-4



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# Introduction

All good two-dimensional graphics are successful illusions. The trees stand behind the house, not on its roof. The type floats in front of the background, not blended into it. Large objects seem closer to the viewer than smaller ones.

Good animation combines two-dimensional illusions with the illusion of movement: a series of images revealed over time. So the Seven Dwarfs march home from work, colorful columns of the latest sales numbers slide up and down, and letters of the alphabet fly slowly or swiftly, sedately or psychedelically, over Chevrolets. Familiar as these visual experiences are, the viewer knows they are all illusions. But if the layout, colors, trajectory, and pacing are effective — the viewer believes it. The result is a powerful medium for informing, convincing, and amusing.

Good animation on the computer is rather like a magician's hat full of tricks. You know there's a logical explanation, but you can't quite see how the sleight-of-hand was done. In both cases, the illusion is achieved by a combination of props, mechanical devices, practiced skills, and — here's where the magic comes in — a personal style. But unlike the magician's hat full of tricks, there's virtually no end of ideas for animations.

Autodesk Animator equips you to create successful illusions. The program calculates motion, creates imaging effects, and provides shortcuts for classic animation techniques. Fine tuning your work until it's ready is easy to do. When the illusion is complete, the program displays it for others to applaud.

*Inside Autodesk Animator* (or *Inside Animator*) helps you attain the skills you need to create successful illusions. We show you what's going on behind the scenes in Autodesk Animator, how to take its power and give it your creative shape, and how to plan and carry out

your ideas with a variety of professional techniques adapted to the medium of the computer.

You bring the style. Every animator, novice as well as expert, develops an individual style of working that reflects personal preferences. Some like to *eyeball* movement, others rely on math. Some animate from *key frame* poses, others draw *straight ahead* from one frame to the next. By the end of this book, you'll be acquainted with the full range of capabilities in Autodesk Animator and you'll be on your way to discovering or refining the style that suits you.

### **What Is *Inside Animator*?**

*Inside Animator* shows you how to create animations on your PC. It is all this and more:

- A series of hands-on tutorials that take you from basic to more advanced animations. Rather than the disconnected exercises and explanations of program features common to computer books, *Inside Animator* teaches you how to use Autodesk Animator to produce real animation work.
- A compendium of tips on animation techniques you can incorporate into presentation graphics, corporate demos, animatics, training aids, educational materials, and desktop video productions.
- A collection of illustrations from professionals who are using Autodesk Animator to produce a variety of presentations: self-running demos for trade shows, architectural walkthroughs, industrial videos, and animatics for TV commercials, among other projects.
- A source of information about bringing art into Autodesk Animator and transferring animations to videotape.

*Inside Animator* is not a substitute for the Autodesk Animator documentation. The combination of this book and the Animator program's documentation provides the ultimate guide to Autodesk Animator. Although we explain procedures as you encounter them, you'll go through the exercises faster and more enjoyably if you've already read the first chapter of the *Autodesk Animator Reference Manual*.

*Inside Animator* will teach you animation as well as how to use the program. If you're a beginner, however, neither this book nor the Animator program can instantly transform you into a full-fledged professional animator. Many professional animators are self-taught, painstakingly polishing skills through much practice, and trial and error. Autodesk Animator helps you practice more efficiently: you can test your ideas immediately, see where you might improve, and quickly try again. *Inside Animator* helps you find a path through this richly complex program so you can focus on building skills while you explore the tools and inks, the color palette, the automatic movements, and other fundamentals.

Perhaps the biggest pitfall for a beginner is the temptation to do too much at once. It's easy to end up creating a cluttered and busily erratic circus, with everything zooming, flipping, and spinning in grand abandon. In addition to stressing simplicity in the exercises, every so often we'll ask you to think through what you expect an effect to accomplish. Why, for example, and under what circumstances would you choose to make broccoli fly?

If you're an experienced animator, the program helps you in other ways. You need not rent camera time to do pencil tests. You can test more color variables than you can in traditional animation. If, like most animators, you've specialized in one sort of movement or another — characters, perhaps, or special effects in conjunction with live action — the program can help you become more proficient in other areas. *Inside Animator* translates the techniques you bring from your experience into techniques that exploit the program's features.

For both the beginner and the experienced animator, *Inside Animator* presents the limits of the program as well as its obvious, exciting possibilities. The screen resolution of 320 by 200 is not ideal. The preset optics movements are powerful but not always the final solution. The variable speed of the program on different computers has practical ramifications for real-world projects. These and other matters are discussed as they come up and where possible, tips are offered to overcome them.

## **How *Inside Animator* Is Organized**

This book is divided into three parts:

- Part 1 is seven chapters covering the basics you need to know in order to create your own animations.
- Part 2 is five chapters demonstrating animation techniques you can adapt to your own projects.
- Part 3 is two chapters on completing your animation projects and turning them into presentations.

The appendixes supply technical information about importing graphics into Autodesk Animator and about transferring animations to videotape.

Although this book is not organized as a reference guide, you can use the index to locate in-depth information about the features of the program, practical tips and techniques, and a wealth of technical information.

## **Read This — It's Important**

We've made *Inside Animator* as easy to use and follow as possible. To avoid errors and misunderstandings, we recommend you read the following two sections before jumping into the exercises.

## **How to Use *Inside Animator***

We assume you have Autodesk Animator running on a properly equipped computer system. We also take for granted that you've been exploring the program a bit. For convenience, we'll refer to the program from here on as "Animator."

Unless you are already comfortable and fairly adept at using Animator, you should start with Part 1 and work through the tutorials at your own pace. Chapter 1 orients you to the operations performed on the main Animator screen. Chapter 2 demonstrates how to begin an animation project. Files you create in this tutorial are used again in Chapters 5 and 6. The remaining chapters in Part 1 take up the fundamentals of tools and inks (Chapter 3), color (Chapter 4), cels (Chapter 5), text and titling (Chapter 6), and segments (Chapter 7).

Part 2 builds on the basics covered in Part 1, taking you through the development of a complete animation project. As you create the elements for an animation project, you'll learn more advanced techniques of classic animation (Chapter 8), titling (Chapter 9), color cycling (Chapter 10), metamorphoses (Chapter 11), and optical effects (Chapter 12).

Part 3 demonstrates making transitions and composite effects (Chapter 13), and linking completed sequences together for presentations (Chapter 14). Of special interest to CAD users is the section in Chapter 14 on bringing AutoCAD wireframe slides and AutoShade renderings into Animator for presentations.

There are also two appendixes. Appendix A offers information about Animator file formats and file conversions, and Appendix B discusses transferring Animator projects to videotape.

Wherever possible, we've organized the book so you can hop and skip, choosing exercises that interest you. However, Parts 2 and 3 progressively build an animation project, so to jump around in those parts, you will need to use the files on the optional IN DISK.

### ***The IN DISK***

The optional *Inside Animator* disk (the IN DISK) contains files that can save you time in doing the exercises. Using the IN DISK files lets you quickly get to the point of an exercise, instead of spending precious time doing preparatory work. These files are also especially useful if you want to skip around in the book. With the IN DISK, you can jump into later chapters, substituting the disk files for what you would otherwise have had to first create in earlier chapters. Shortcut instructions for IN DISK users are shown in the exercises. If you have the IN DISK, see the instructions packaged with it for installing it. If you don't have the IN DISK, see the order form in the back of the book, or call New Riders Publishing at 1-800-541-6789.

### ***The Exercises***

The exercises in this book are designed so that you can quickly see what to do. Instructions typically begin with a key word, such as *Click*, *Drag*, or *Enter*, that indicates the action you take. Next is the item on which to act, such as the name of a menu selection (**APPLY INK**), a drawing tool (**LINE**), or some other item (**mini-palette**).

To the right there may be additional instructions or information you need to know to perform the command. If the first word of such a comment is in *italic type*, it is a further instruction; if not, it is merely a comment intended to clarify the results.

---

### Examples of Exercise Instructions



If you have the IN DISK, take this shortcut.



If you don't have the IN DISK, do this.

<code>C:\&gt; cd \aa\in</code>	Changes directory.
<i>Click</i> <b>OPAQUE</b>	Highlights OPAQUE ink.
<i>Open</i> <b>PIC</b> <i>Select</i> <b>APPLY INK</b>	Opens PIC menu and selects APPLY INK.
<i>Click</i> <b>mini-palette</b>	Select orange as current color.
<i>Drag</i> <b>brush slider</b>	Set brush size to 8.
<i>Right click</i> <b>frame control icon</b>	Displays frames panel.
<i>Type</i> <b>x</b>	Clears screen, using keyboard shortcut.

---

Watch out for 0 (zero) versus the letter O, and for 1 (one) versus the letter l. The typeface in the exercises makes it hard to see the difference. DOS operating system prompts are shown like the `C:\>` above. When typed input is shown, like the `cd \aa\in` above, we assume you will enter it with the <enter> key.

The exercises are written for a mouse, or for the equivalent action with a tablet's pointing device. (We strongly recommend using a tablet and stylus, with two buttons, or pressure point and one button, for artistic control.) Many people find it more efficient to use keyboard shortcuts, so the exercises include examples in order to demonstrate this alternative.

You often have a choice about performing actions in Autodesk Animator. For example, you can play a flic from the home panel or from several other panels. Where you have such a choice, the instruction indicates the most direct path.



Key Words in Exercise Instructions	
Key Word	Meaning
Select	Choose an item from a menu. With the mouse, this includes moving the mouse over the menu bar until the menu opens, moving down the menu to the item, and clicking. With the keyboard, this means typing the initial of the menu and item or the one-character shortcut.
Click	Press and release left mouse button.
Right click	Press and release right mouse button.
Double click	Press and release left mouse button twice in quick succession.
Use	Perform task with a selected tool.
Type	Type letters or numbers on the keyboard.
Enter	Use most convenient method to provide information in a dialogue box or in a file operation. This may include clearing the field, clicking on a filename, dragging a slider, typing in letters or numbers, and completing the action by clicking on [OK] or using the <enter> key.
Press <key>	Press and release key on keyboard, such as <enter>, <spacebar>, <tab>, <del>, or <F1>.
Move	Click to pick up an object, move the mouse to move cursor, and click to place the object.
Drag	Hold down left mouse button while moving mouse.
Right drag	Hold down right mouse button while moving mouse.

### ***Should Things Go Wrong***

No, they shouldn't, but if they do:

- Try again. Look at previous exercises for problems in their results that may affect the current exercise.
- Read *Inside Animator* and *The Autodesk Animator Reference Manual* carefully.
- If it is a problem with Animator, call Autodesk Animator Product Support at (415) 332-8942.
- Try the Autodesk forum on CompuServe (go ADESK) to access the world's largest and best Autodesk Animator user group.
- If there is an error in the exercises, or a problem with installing the IN DISK, call New Riders Publishing Technical Support at (503) 661-5745. However, we cannot answer general questions on Animator; we can only answer specific questions on the *Inside Animator* book.

## Our Contributors

In the course of writing this book, we sought out graphics artists, CAD specialists, and professional animators who were working with Autodesk Animator on projects in various fields. Their experiences with the program suggested some of the tips and stimulated some of the clarifying notes.

We've chosen samples of projects from five animators to include as illustrations in the chapters on advanced techniques. We hope you'll agree that these illustrations exhibit a range of styles and imaginative, spirited executions.

- Jeri Johnston, who has been using Autodesk Animator since its development stage, heads the graphics design firm Johnston Design Associates (Novato, California). She supplied the butterfly logo in Chapter 12 and the sparkling titles in Chapter 13.
- Keith Metzger is the principal and creative director of Amazing Media (San Anselmo, California), which produces self-running animated presentations. The animated computer closeup with composited titles in Chapter 13 is from a presentation introducing Amstrad computers to the U.S. market (copyright Amstrad, Inc., 1990). The rendering of the computer components at the beginning of Chapter 14 are from Amazing Media's presentation for Western Digital (copyright Western Digital, 1989).
- David Nilsen is an applications specialist at Ketiv Technologies, Inc. (Portland, Oregon), with extensive experience using AutoCAD, AutoShade, and AutoFlix before taking up Autodesk Animator. The illustrations in Chapter 8 are from his "Quitting Time" and "Robotruck" animations. The flying disk in Chapter 12 and the brake assembly in Chapter 14 are his also.
- Robert Quinn, an independent designer working with Fleet Street Pictures (San Francisco, California) contributed his version of the Club Baltic animation project based on the storyboard in Part 2, key frames of which appear in Chapter 13. The illustrations at the beginning of Chapters 6, 9, 11, and 13 are also his, as is the selection from his animated MTV logo in Chapter 14.
- Cap Stocks, a CAD applications developer at Caricato Systems (Santa Rosa, California), has supplied us with the architectural walkthrough of a house, which is included in Chapter 14. The individual frames for this animation were created using Architectural Power Tbol™ which is a product of Caricato Systems.

All original art, unless otherwise noted, was the work of Lee Marrs. Ken Billing at New Riders Publishing developed the exercise for the 3D animation in Chapter 14. All other exercises were developed by Leah Freiwald. The screenshots of the exercises were created by Leah Freiwald and Lee Marrs. Slides for scanned images were provided by Joshua Freiwald, Bernard Freiwald, and Damon Rarey. Autodesk, Inc., permitted us to reproduce the sample files SAMBURU.GIF, WALK.GIF, MOON.GIF, and FISH.CEL. Todd Meisler at New Riders Publishing and Jill Casty at Jill Casty Design were responsible for the cover art.



BALLOONS



COSMOS



HOUSE



INSIDER



MACHINE



PIECHART



STARMAN



TRUSSES ARE US









BROWSE FLICS

LOADVIEWINFODELETE

CANCEL

MACHINE

OK



DRIVE 

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Previewing Part 1

# Learning Animation

Part 1 introduces the essentials you need to learn so you can create your own animations. Each chapter covers basic components of the Animator program:

- Chapter 1 shows you how to organize your files for working in Animator, how to make choices from menus, how to get from panel to panel in the program, and introduces the items on the home panel.
- Chapter 2 takes you through the preliminary phases in planning an animation project and testing the placement of moving elements.
- Chapter 3 covers the many tools and inks you can use to draw, paint, and process the images in your animations.
- Chapter 4 explores the options for setting up and using colors in your animation.
- Chapter 5 illustrates the important concept of the cel in Animator.
- Chapter 6 shows you how to work with text, both still and animated.
- Chapter 7 introduces and explores techniques for adjusting your animation's pacing and timing.

The exercises demonstrate practical applications, such as building an animated chart, making titles, and creating a write on. If you're already acquainted with Animator, you can skim Part 1, reviewing what you know and noting the many tips. The files created in these chapters are not used again in Part 2 or Part 3. However, the exercises in later parts assume you've learned the basics in Part 1.





# Setting Up a Studio

Learning Animator is, at the outset, like moving into a new studio. You need to put away supplies, perhaps clear a corner for new projects. At first you fumble for the light switch, but soon you know your way around and hardly ever bump into the furniture.

This chapter shows you how to set up Animator for the tutorials in this book, how to start the program and move around through the menus and panels, and how to decide what you want the program to keep track of until the next session. By the end of this chapter, you'll appreciate the ease with which you just pick up the brush tool and begin drawing.

## Setting Up Animator

Initially, all the Animator files are installed in one directory on your hard disk. (The various types of Animator files are described in the appendixes.) The font files (extension FNT), sample animation files (extension FLI) and picture files (extension GIF), and the other files on your original Autodesk Animator disks are in the AA directory, the same directory that contains the program file (AA.EXE).

To get set up for the *Inside Animator* tutorials, you'll make a subdirectory to hold the files you create working through the chapters of this book. If you have the optional *Inside Animator* disk (IN DISK), you'll install its files into this subdirectory also.

**NOTE** *The examples and exercises in this book are written as if you've installed Animator on drive C in the AA directory. If the program is installed on another drive or if the directory has another name, substitute your own directory and drive path when instructions require such information.*

*For example, if you've installed Animator on drive D in the ANIM subdirectory, you would substitute D:\ANIM when the instruction is to go to or install files in C:\AA.*

### ***Making the IN Subdirectory***

In the following exercise, you'll change (if necessary) to the directory in which you've installed Animator. Then you'll make a subdirectory called IN to hold the files you want to save from the INSIDE Animator tutorials and the files on the IN DISK.

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### **Making the IN Subdirectory**

C:\> cd aa	Changes to Animator subdirectory.
C:\AA> md in	Makes subdirectory named IN.

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**TIP** *For your own work, you may want to make additional subdirectories for your own Animator work files. Once you accumulate a number of animations and drawings, keeping different types of files in separate subdirectories is more efficient, especially for DOS operations. You might make a subdirectory for your animation files, another for picture files, and a third for font files.*

### ***Installing the IN DISK***

If you have the IN DISK, install it now. (If you don't yet have the disk, we recommend obtaining it. There is a mail-in order form on the last page of this book).

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### **Installing the IN DISK**

Insert the IN DISK in drive A.

C:\AA> cd in	Changes to IN subdirectory.
C:\AA\IN> a:in-load	Copies and unpacks files from IN DISK to IN subdirectory.

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## Starting Animator

Each time you start Animator, the main screen appears. You can immediately begin a new drawing, load a drawing or animation from disk, or return to where you left off editing a previous drawing. The main screen is divided into three sections: the menu bar at the top of the screen with seven main menus; the home panel at the bottom of the screen with the current assortment of tools, inks, and colors; and the drawing area in between.

To start Animator, you must be in the directory in which the program files are installed. If you are in the IN subdirectory, you must first return to the AA directory, as illustrated in the next exercise.

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### Starting Animator

```
C:\AA\IN> cd \aa  
C:\AA aa
```

Changes back to AA directory from IN subdirectory.  
Starts Animator.

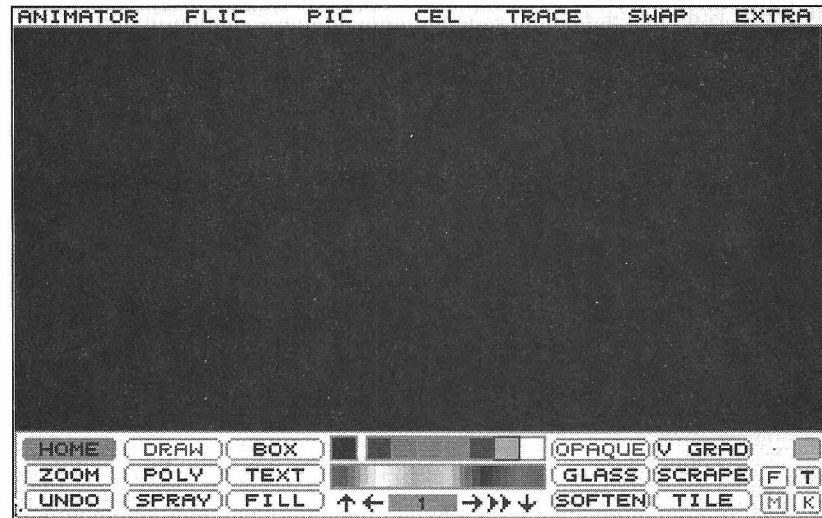
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**NOTE** *You can operate the program with a mouse or with a tablet's stylus or puck. If you use a stylus, it must be the type that has a button in addition to the pen-press or pick button. In the exercises, we assume you are using a mouse.*

The main screen menus and the home panel always appear together. From the main screen, you can move to other screens, either by selecting an item on a menu, such as OPTICS on the ANIMATOR menu, or by right clicking on an item on the home panel. Some screens display another panel, such as the frames panel, while the rest of the screen displays the drawing area. Two screens, the optics screen and the palette screen, display another panel and another set of menus on the menu bar. To return to the main screen, right click in the drawing area.

In general, you right click to move around in the program. Right clicking on the home panel takes you to another screen. Right clicking on a tool slot, for example, takes you to the drawing tools panel. Right clicking in the drawing area brings you back to the main screen from another screen. If you are also canceling a set of options or an

operation on another panel, you may need to right click several times before the main screen is displayed again.



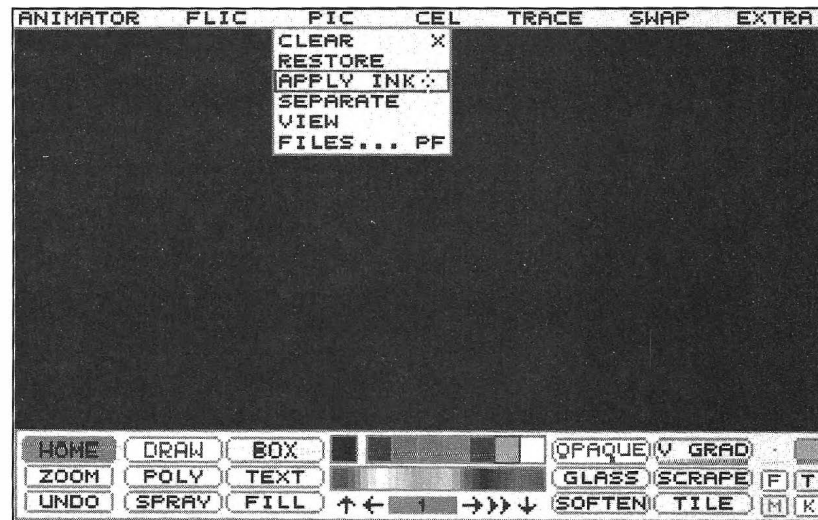
Animator Main Screen

## Main Screen Menus

Animator's menus are designed for selecting items with a mouse or a tablet's stylus or puck. You can, however, select an item by typing the initial letter of the menu item and of your selection. There are also shortcut entries from the keyboard for items you'll most likely be selecting repeatedly; these appear to the right of a menu item.

**TIP** *If you use a stylus, try configuring the program for a puck. The action of the stylus's point and button is reversed: pressing the button on the stylus is the equivalent of clicking the left mouse button and pressing the point on the tablet is the same as a right click on the mouse. You may find it more comfortable to hold down the button to draw, instead of holding the point pressed on the tablet.*

Items on the main screen menus followed by an ellipsis (...) do not immediately put your choice into effect; instead, another menu of options appears. For example, selecting EFFECTS on the FLIC menu displays the special effects options, from which you make your selection either by clicking on an item or by typing the number shown beside the item.



*Main Menu Bar, Pic Menu Open, Apply Ink Selected*

### ***Selecting From Menus***

To make a selection from a menu, open the menu and position a red box over the item. The next exercise shows how to change the background color by selecting the item APPLY INK from the PIC menu.

### **Selecting From a Menu**

Open **PIC**  
Select **APPLY INK**

*Move mouse along menu bar to PIC menu.  
Move mouse down PIC menu until red rectangle is around  
APPLY INK, and click left mouse button.*

In the rest of the exercises, the instruction to open a menu and select a menu item is combined on one line, like this:

*Open **PIC** Select **APPLY INK***

### ***Keyboard Shortcuts***

There are two kinds of keyboard shortcuts. The first is simply to type the first letter of a menu and the first letter of a menu item. For example, to apply ink from the keyboard, you would type the initial of

the PIC menu and the initial of the APPLYINK item, so you would type **PA**. This kind of shortcut is available for all menus, including those on the palette and optics screen.

The other kind of keyboard shortcut is a single-key alternative. Not all items have one. You'll find it helpful to photocopy the following table and keep it nearby; these are some of the shortcuts you'll probably use most often. The *Autodesk Animator Reference Manual* lists all the single-key alternatives.

Selected Single-Key Alternatives	
<i>From Keyboard</i>	<i>Same As</i>
b	Brush
m	CEL MOVE
n	FLIC NEW
o	ANIMATOR OPTICS
q	ANIMATOR QUIT
z	ZOOM
'	CEL PASTE
<backspace>	UNDO
<esc>	CEL GET
<spacebar>	right click
<tab>	CEL CLIP
<left arrow>	left arrow frame icon
<right arrow>	right arrow frame icon
<up arrow>	up arrow frame icon
<down arrow>	double arrow frame icon

The next exercise illustrates how to use both kinds of keyboard shortcuts.

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## Using Keyboard Shortcuts

Type <b>x</b>	Clears screen with single-key shortcut for PIC CLEAR. The original background color is back in just one keystroke!
Type <b>pa</b>	Applies current ink again, using two-key shortcut.
Clear the screen again.	

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**TIP** *As you become familiar with Animator, you'll find that sequences you repeat often can be performed more quickly from the keyboard. For example, to go from the main screen to the optics screen and clear all the preset motions, you can type **OPC**. These three keys combine the shortcut to the optics screen, the initial of the PRESETS menu, and the initial of the CLEAR ALL item.*

## The Home Panel

Covering the bottom third of the main screen is the home panel. The original or *default* arrangement of items on the home panel is just a starting point. You can set up particular tools, inks, and colors you want to have handy while working in the drawing area. For example, if you're drawing a birthday cake with candles lit, you might need pink and green for the icing, the oval tool and perhaps glaze ink.

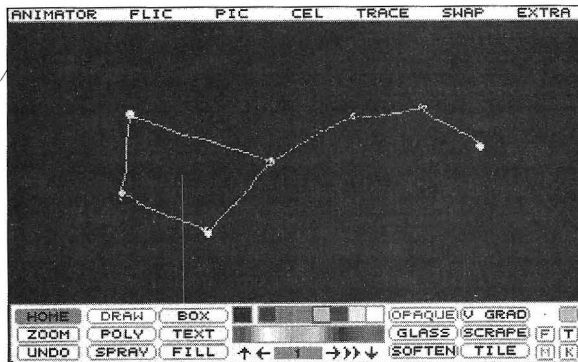
In the default arrangement, the draw tool and opaque ink are highlighted, indicating each is ready to be used. The default color in the current color slot at the far upper-right corner of the home panel is powder blue. This is the color outlined in the mini-palette, the group of seven colors in the middle top of the home panel. Thus, if you start drawing, the result is powder blue in opaque (solid) ink.

### *The Brush*

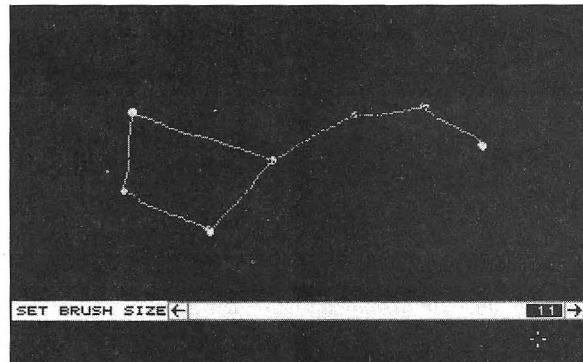
The brush icon is the dot immediately to the left of the current color slot. Its size determines the width of the brush stroke. The default setting is one pixel, the smallest brush.

## Changing Brush Size

Click <b>brush</b>	Changes brush from one pixel to four pixels.
Click <b>screen</b>	Click once in middle of drawing area to produce a blue dot. Notice that the dot in the middle of the crosshair cursor is now larger than one pixel and the dot on <b>screen</b> is the same size.
Click <b>screen</b>	Click six times as you move the cursor across the screen to create the pattern of the Big Dipper.
Click <b>mini-palette</b>	Click on orange color in mini-palette to select it as current color.
Click <b>brush</b>	Returns to original brush size, one pixel in width.
Use <b>DRAW</b>	Connect the stars.



Big Dipper



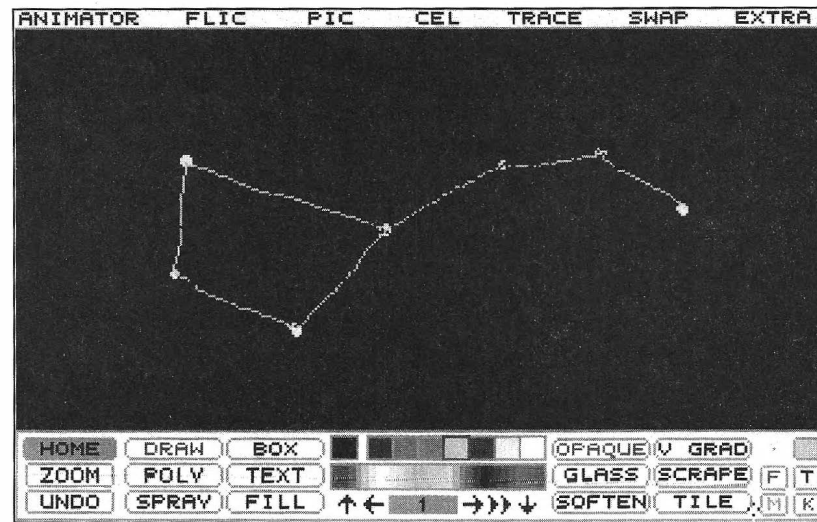
Brush Slider Bar

The brush icon is a *toggle*. Clicking on it switches between two sizes: the smallest brush size, always one pixel in width, and the size set on the brush slider bar. To see the brush slider bar, right click on the brush icon. To change the setting, hold down the left mouse button and drag the slider. The largest brush size is 11 pixels.

### Home Panel Toggles

Several other items on the home panel are toggles that you turn on and off like light switches. When turned on, such items are highlighted. For example, the mode buttons located below the brush icon and current color slot — [F] [M] [T] and [K] — are such toggles. Clicking on a mode button when it is not highlighted turns it on; clicking on it again turns it off.





### Mode Buttons

Clicking on the [F] button turns fill mode on and off; clicking on the [M] button turns mask mode on and off. The [T] button regulates time mode; and the [K] button makes the key color transparent when it is on and opaque when it is off. We'll look at these buttons in more detail in later chapters.

The zoom button, below the title on the home panel, is another toggle. When ZOOM is on, it magnifies a portion of the screen by a factor of either two or four. To change the magnification factor, you right click on ZOOM and then click on the option you want. An asterisk indicates which option is selected.

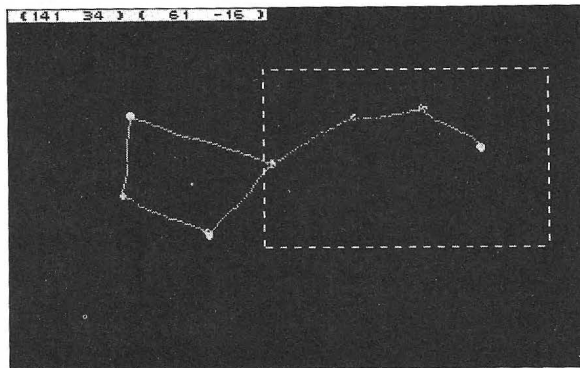
Here's how to set the zoom box to magnify the portion of the screen you choose.

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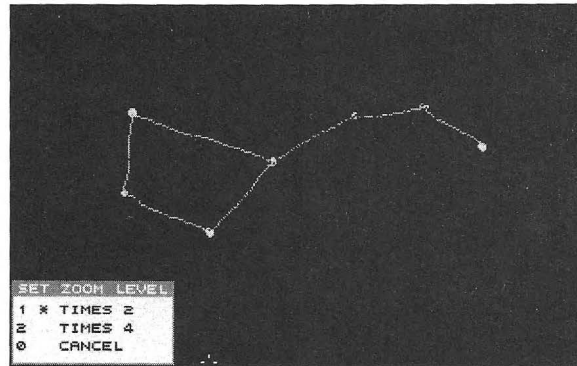
### Zooming In

Click <b>ZOOM</b>	Turns on ZOOM and displays zoom box in center of screen.
Click <b>screen</b>	Prepares zoom box to be moved.
Move <b>mouse</b>	Move zoom box over tail of Big Dipper.
Right click <b>screen</b>	Zooms in on portion inside zoom box.
Click <b>ZOOM</b>	Turns off ZOOM.

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Setting the Zoom Box



Zoom Settings

Right click on the home panel to move to other parts of the program. For example, right clicking on the current color or on the cluster box takes you to the palette, where you can change the colors that are available on the home panel. The cluster box is the grouping of colors below the mini-palette on the home panel.

In the next exercise you'll display the palette and select a *gray-scale* cluster of colors to use with a *gradient* ink; that is, one of the inks that applies all the colors in the cluster box at once, rather than the single current color.

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## Changing the Cluster

*Right click cluster*                      Displays palette screen.

*Click [A]*                                Selects the *gray-scale* cluster.

*Right click screen*                    Returns you to home panel.

The *gray-scale* cluster replaces the *rainbow* cluster on the home panel.

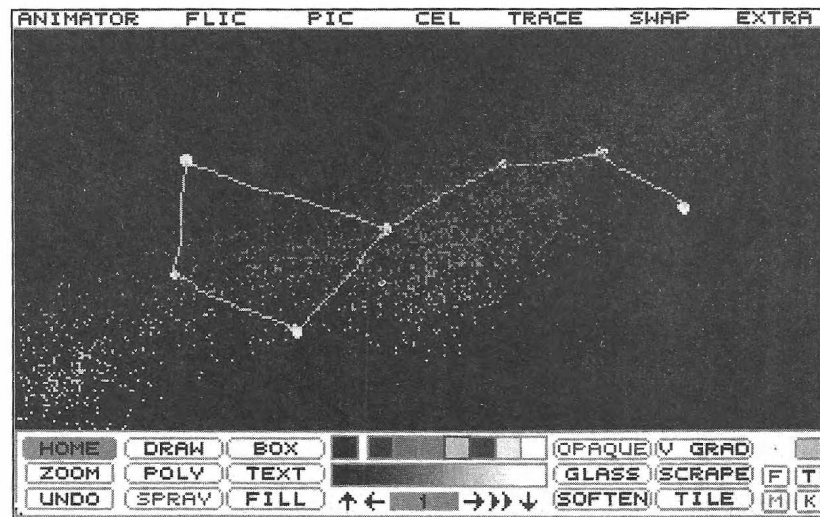
*Click SPRAY*                          Highlights spray tool.

*Click V GRAD*                        Highlights vertical gradient ink.

Hold down the left mouse button and move the mouse to spray the screen from lower left to upper right.

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Why settle for seven stars when it's so easy to create the cosmos!



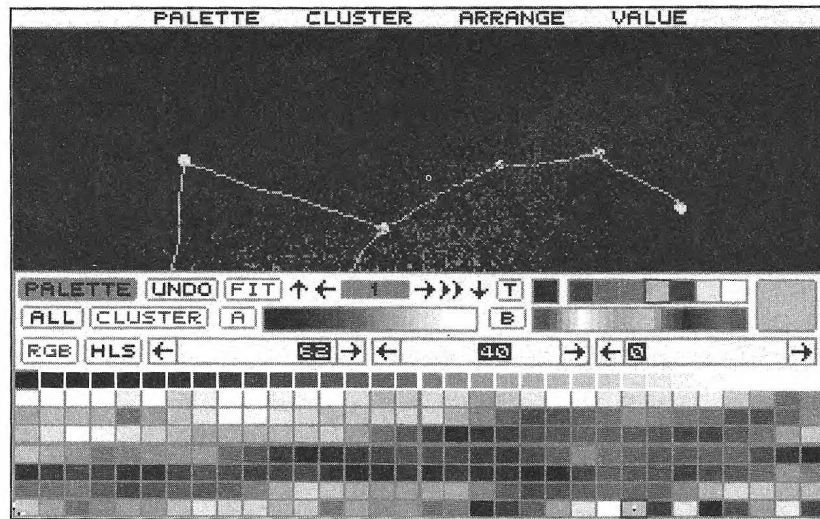
*Trying Out Items on the Home Panel*

### ***Duplicate Items***

Some items appear on other panels as well as on the home panel. You may have noticed that the current color, the cluster, and the mini-palette, appear on the palette panel. So do the key color slot, which is located to the left of the mini-palette, and UNDO, the button below ZOOM on the home panel. Thus, if you need to select one of these items while changing colors on the palette panel, you do not need to return to the home panel and back again to the palette panel. How to select and use all these items is covered in Chapter 4.

The frame control icons, the group of arrows in the bottom center of the home panel, are used to play animations and to move forward and backward through them. They appear on the palette panel and on several other panels so that you can step through an animation or play it from different parts of the program. You can also play an animation as soon as you load it on the FILES panel.

**TIP** *You'll save time if you get in the habit of selecting an item, such as the current color, on the panel you're working on, rather than going back to the home panel. It may help to observe that items don't always appear in the same spot on other panels.*



*Duplicate Items on the Palette Panel*

### ***The Drawing Area***

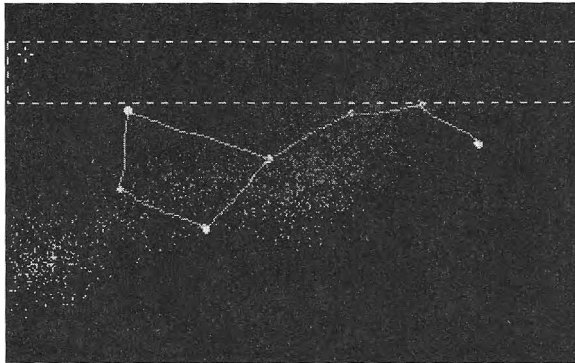
The drawing area is your full screen. It is not limited to the space between the menu bar and the home panel. One way to draw on the area under the menu bar or panel is to start in the main drawing area and continue to hold down the mouse button as you draw over the menu bar and home panel. You can extend lines or the effects of any drawing tool in this manner. If you had continued to spray up to the farthest right corner of your screen in the previous exercise, your galaxy would extend beneath the menu bar.

To display the main screen without the menu bar and the home panel, right click in the drawing area. You can then see whatever you draw that would otherwise be covered. Right click again to restore the menu bar and home panel to the screen. You can also view the entire screen — but not draw on it — when you select VIEW on the PIC menu. After viewing the screen, right click to restore the menu bar and home panel.

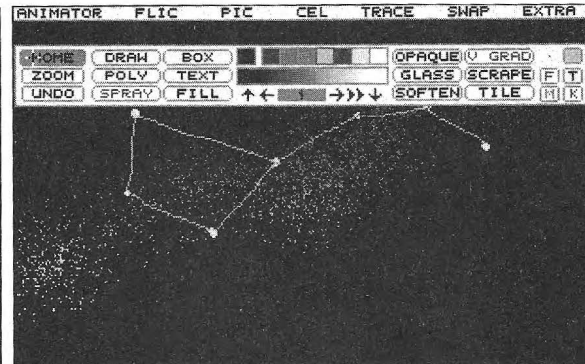
### ***Relocating Panels***

Occasionally, you may want to move the home panel to another place on the screen. Click on HOME, move your cursor, and click again to place the home panel in a new position. Then you can draw in the area

at the bottom of the screen and see the results, while the panel is still available for you to change colors, brush size, or whatever you want to change. To return the home panel to the bottom of the screen, right click on HOME.



Home Panel Moving Up



Home Panel In New Position

You can move other panels the same way. Click either on the panel's title slot in the upper left corner or, if there is none, on the panel's title bar.

**TIP** *It's often easier to right click or use the space bar to get panels completely off the screen, then right click or press <spacebar> again to display them when needed.*

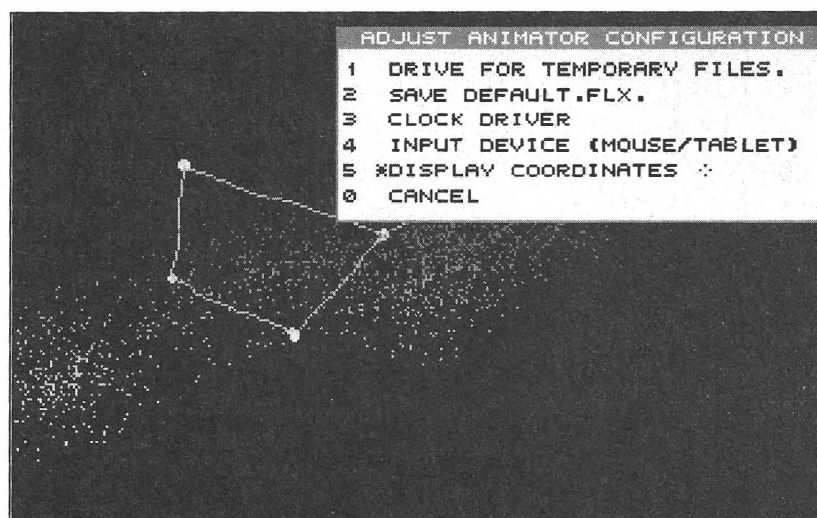
*It's a good idea to design the layout of your drawing without the home panel at the bottom of the screen. You can either display the screen without the home panel or, if you need the home panel, move it up. Otherwise, you'll tend to ignore the bottom of your layout if the home panel is always there.*

### ***The Status Line, Coordinates, and Grid***

During certain Animator functions, a *status line* replaces the menu bar. You can use it to track the location of the cursor as you draw. Information on the status line appears in a variety of operations to change color selections on the palette panel.

You may prefer to turn off the status line for freehand drawing and at other times when the information is not essential. To turn off the status line, select CONFIGURE on the EXTRA menu and then select

DISPLAY COORDINATES, which actually controls the entire status line. This item is a toggle. When marked by an asterisk, DISPLAY COORDINATES is on and the status line appears. Selecting it turns it off; selecting it again turns it on.



*EXTRA Menu, DISPLAY COORDINATES Toggled On*

For more precise drawing, you can display the status line and use a grid as well. To see the grid, select GRID on the EXTRA menu and then select VIEW, as in the next exercise.

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### Viewing the Grid

*Open EXTRA Select GRID*

*Select VIEW*

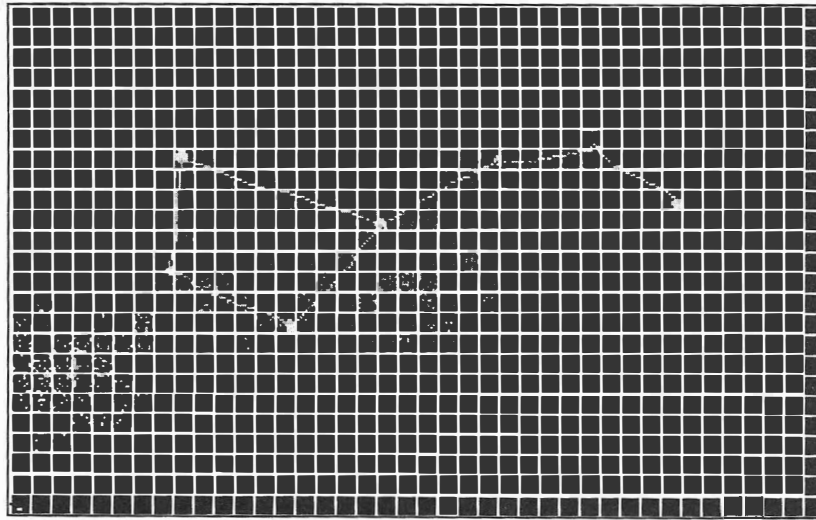
*Displays current grid using current color.*

*Right click screen*

*Right click twice to cancel the grid display and the GRID menu.*

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When you want to snap straight lines to the grid intersections, you'll select USE (an asterisk marks USE when it's in effect). By selecting CREATE, you can design your own grid. You'll work with the default grid in Chapter 3 and create a grid in Chapter 8.



Displaying the Default Grid

GRD

**TIP** *In classic cel animation, use a grid and the status line to place an element on an inbetween frame at a precise distance from its placement on the preceding and succeeding frame. You can also use a grid to align a cel from frame to frame. The result is smoother motion.*

## Frames and Flics

Individual Animator *frames* are saved as GIF files; animations or *flics* are saved as FLI files. Since a flic is composed of a sequence of frames, you can combine GIF files to create a flic. By the same token, you can save individual frames of a flic as GIF files.

### ***GIF and FLI Files***

Images from a variety of sources can come into Animator as GIF files: scanned photographs and line drawings, frames captured from videotape, drawings produced with high-level paint programs, and CAD programs are some of the possibilities. Once an image is a GIF file in Animator, you can edit it and use it in a flic. The illustrations below are of two 35mm slides that were scanned into a CIS • 3515 professional scanning system from Barneyscan Corporation, as described in the appendixes. The illustration at the beginning of this chapter is a live image captured from a video camera with a Jovian VIA board and processed with a variety of Animator tools and inks.

You can convert the files of most graphics programs that do not store images in GIF format with readily available conversion programs — a number of them are free — or by Animator's CONVERT.EXE utility program. The appendixes discuss converting files to GIF format.



*Two Scanned Photographs*

**TIP** *Animator's sample GIF and FLI files are a good place to start experimenting with the program. At your leisure, try loading a sample GIF file and adding your own painterly touches.*

### ***The Browse Flics Screen***

The browse flics screen is an interactive picture gallery of your FLI files: each of the black squares can display the first frame of a flic. The fastest method for loading a flic is to select BROWSE FLICS on the ANIMATOR menu (not on the FLIC menu) and then double click on the file's image. The file loads, the first frame is displayed on the main screen, and it's ready to play or edit.

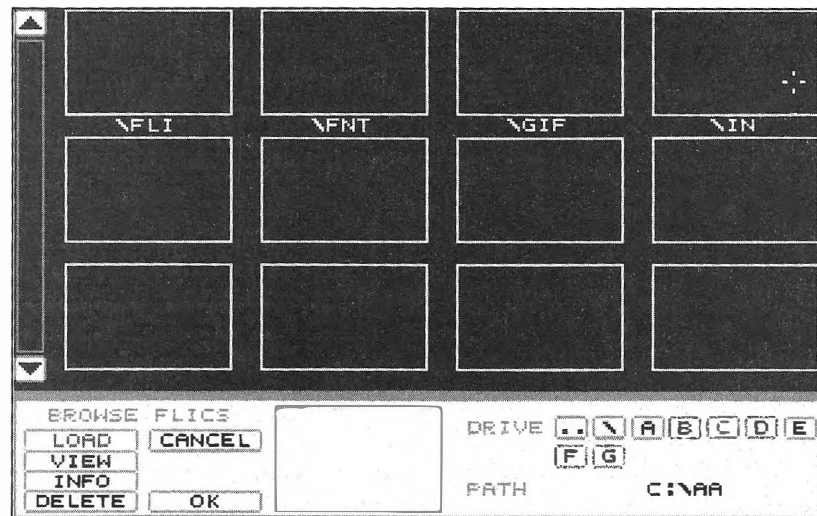
If you just want to review a flic without loading it, select VIEW instead of LOAD before double clicking, and the flic plays through once. If you want to know the file size and frame statistics, select INFO first. The alternative to loading by double clicking is to click on an image and to click on it again when it appears in the preview frame in the middle of the panel. Although it takes more steps, this method is useful for keeping one image on screen while browsing through a large group of flics.

When there are too many files to display all at once, drag the slider or click on the arrow buttons on the left side of the panel to display other



files. The filenames are ordered alphabetically, so click the up arrow or move the slider up to move toward the beginning of the alphabet. Use the down arrow or move the slider down to go toward the end of the alphabet.

**NOTE** *If you've created a subdirectory for your FLI files and moved them into it, the picture gallery doesn't appear immediately when you select **BROWSE FLICS**. Instead, the names of the Animator subdirectories appear in the squares. You must click on the subdirectory containing your FLI files to display the pictures.*



*Browse Flics Screen Showing Animator Subdirectories*

## Browsing Among the Sample Flics

Open **ANIMATOR** Select **BROWSE FLICS**

**Double click flic** Clicking twice in rapid succession on a sample flic loads it.

As you can see, the flic replaces the drawing on screen. You need not clear the screen before loading a flic. Notice that the colors on the home panel are different now. If you right click on the cluster, you can see the flic's palette.

### ***The Frame Control Icons***

Once a flic is loaded, you can play it or examine its frames with the frame control icons: the up, left, right, and down arrows and the double arrows surrounding the frame number box on the home panel. Now you can play the flic.

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### **Playing a Flic**

**Click frame control icon**    Click on the double arrow frame control icon to play the flic.  
The flic plays through and replays until you stop it.

Press any key or right click to stop the flic.

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The following table indicates what each frame control icon does.

<b>Frame Control Icons</b>	
<b><i>Icon</i></b>	<b><i>Function</i></b>
↑	Moves to frame 1.
←	Moves one frame back.
→	Moves one frame forward.
→→	Play flic forward from current frame.
↓	Move to last frame.

### **Leaving Animator**

If you've already spent some time exploring Animator, you've no doubt noticed that you can quit the program, do something in another program, and return to Animator to find your picture on the screen, the tools and inks arranged just as before, and other settings and buffers intact. Unless you've configured a RAM disk or reset the program before quitting it, you'll find the same work-in-progress waiting for you after turning off the computer and taking a month's vacation.

### ***Temporary Files***

Much is going on behind the scenes, so to speak, in Animator. Temporary files hold the flic or picture you are working on, the colors, the optics path, any polygons you're tweening, a macro you've loaded, and the latest images or information in the buffers: the cel buffer, the text buffer, the polygon buffer, and the swap screen buffer. These temporary files are stored in the AAT directory Animator created on your hard disk when you configured the program. They are constantly being updated as you work in Animator.

**NOTE** *If you've configured Animator for a RAM disk, the temporary files are stored on the RAM disk, not on the hard disk, and are lost when you turn off the computer. You can copy them back to the hard disk before turning off the computer, but then you must also copy them to the RAM disk the next time before starting up again.*

You have the option of transferring the contents of the temporary files into permanent storage. For example, you can save the flic as a FLI file, the pictures on the main screen and the swap screen as GIF files, the macro in a REC file, the cel in a CEL file, and so on with the polygons, optic paths, and text. If you would rather find a blank screen when you start Animator, save what you want to keep and reset the program before leaving Animator, as explained next. If you're using a RAM disk, just don't copy the temporary files to the hard disk.

### ***Resetting Animator***

To restore the default settings, reset the program. This can be done at any time during a session when you want, in effect, to start over from scratch. For the exercises in this book, we'll assume that the default settings are in effect at the beginning of each chapter.

To restore the defaults, select RESET on the FLIC menu and confirm by clicking [Y] or typing Y. Since you haven't created anything memorable yet, it's okay to reset the program now.

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## **Resetting the Defaults**

Open **FLIC** Select **RESET**  
Click [Y]

Confirms you want to reset defaults.

---

Now the screen is blank and the arrangement of items on the home panel is back to its original state. The colors in the mini-palette and cluster are the same as they were originally, the brush size toggles between 1 and 4, and all the other original default settings in the program are restored.

### ***The DEFAULT.FLX File***

When you reset Animator, you're asked if you want to restore the default settings, which are stored in the DEFAULT.FLX file. You can change this file, putting settings in it you find more convenient than the original program settings. Any settings you don't change are restored to the original settings.

The following exercise creates a DEFAULT.FLX file that sets up a directory path that displays the files in the IN subdirectory when you select BROWSE FLICS and other file operations.

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### **Creating a DEFAULT.FLX file**

<i>Type</i> <b>fry</b>	Resets program to make sure defaults are restored, using keyboard shortcut.
<i>Open</i> <b>ANIMATOR</b> <i>Select</i> <b>BROWSE FLICS</b>	
<i>Click</i> <b>square</b>	<i>Click</i> on square labeled for IN subdirectory, using selector bar to display more squares, if necessary.  If the IN disk files are not installed in the IN subdirectory, all squares are black at this point.
<i>Click</i> <b>CANCEL</b>	You don't want to do anything on the BROWSE FLICS screen other than to set the path to \AA\IN.
<i>Open</i> <b>EXTRA</b> <i>Select</i> <b>CONFIGURE</b> <i>Select</i> <b>SAVE DEFAULT.FLX</b>	Creates DEFAULT.FLX file with \AA\IN as new default directory.

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When you reset Animator or start the program after rebooting, the directory path will be set to \AA\IN. You can, of course, move to the AA directory or to any other Animator subdirectories from within the program. You'll be instructed to reset the program at the beginning of each chapter in order to make certain you're starting the exercises with the \AA\IN directory as the default directory and the other defaults restored. If you ever want to restore the original default settings, just delete the DEFAULT.FLX file in DOS.

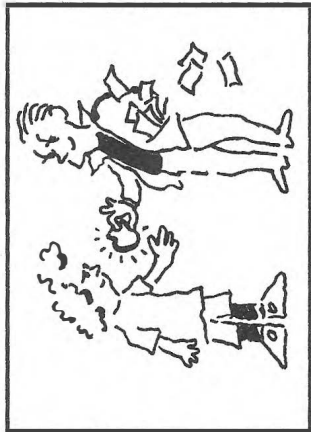
## Next Steps

Now that you've explored Animator a bit, you're all set to start drawing and animating in Chapter 2. From there, you can go on to a thorough grounding in the basics you'll need to produce interesting animations.

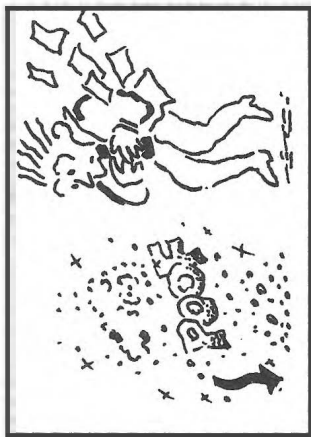
Scene 5 / Dealer.



1 "The temptation to make money selling drugs..."



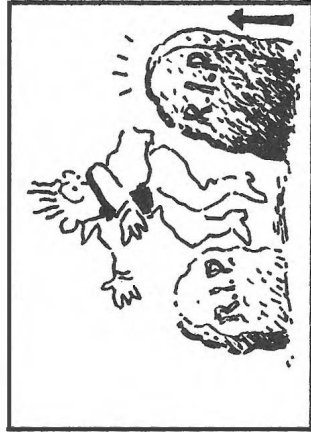
2 "... is very real. But..."



3 "... so is the damage."



4



5 "Next time it might be your neighbor, your..."



6 "...best friend, your little sister or brother."

# What's My Project?

You can learn a great deal about Animator by trying out features with no particular goal in mind. But the time comes when you say, “Eureka! I have an idea for something to animate! How do I begin?”

This chapter describes the preliminary steps for designing an animation so that the parts ultimately fit together and produce the effect you want. If you are new to animation, you'll learn basic techniques for planning your projects. If you are an experienced animator, you'll see which features let you apply techniques you've used in other media or in other programs.

## Planning Ahead

Because the essence of animation is movement, you need to plan how your animation begins and how it ends. How does each moving element navigate the distance from its initial entry on screen to its final position? Is the cow jumping over the moon at the same time the dish is running away with the spoon, or is the action staggered?

How long is the animation going to be? That is, how many frames are needed to get from here to there? The length and the pacing of sequences are significant factors to take into account in your planning. You may want the movement to flow lyrically or to be staccato and erratic.

What sort of background is appropriate? A surfer's beach, skyscrapers, somewhere in space near the outer rings of Saturn? You need to plan what will be transparent when you composite the moving elements over the background.

Planning may include whether the animation is to be cyclical (looping back on itself) or whether it is to be a story with a beginning, middle, and end; how colors are to be used for effect; and where text is to

appear. There may be technical considerations as well that figure in the planning such as whether you're going to add music, import files and scan drawings, or incorporate live action from videotape.

### ***The Storyboard***

Many animators sketch out an idea in the form of a *storyboard*, a series of pictures that represent the most important moments in an animation. If the idea is new to you, think of it as a graphic plot summary or outline of the action.

Storyboards originated at least as far back as Egyptian hieroglyphics. An animator at the Disney studio is credited with making up the first cartoon storyboard in the 1930's, where it became a central focus for the team effort that produced the Disney films. Today, storyboards are often used by advertising agencies and corporations for testing reactions to ideas at an early stage.

Preparing a storyboard, such as the one illustrated at the beginning of this chapter, helps refine a suitable idea. In the process, you can discover the types of movement that create the best animations. The pictures sketched for the storyboard may become frames in the animation. Just as valuable, the storyboard helps you reject ideas that are not likely to be successful before you invest too much time and energy in them.

**TIP** *Although it's possible to draw a storyboard directly in Animator, you may find it easier to sketch it first on paper. If you then decide to present the storyboard on the computer, you can either scan in the sketches or translate them into Animator frames with the drawing tools.*

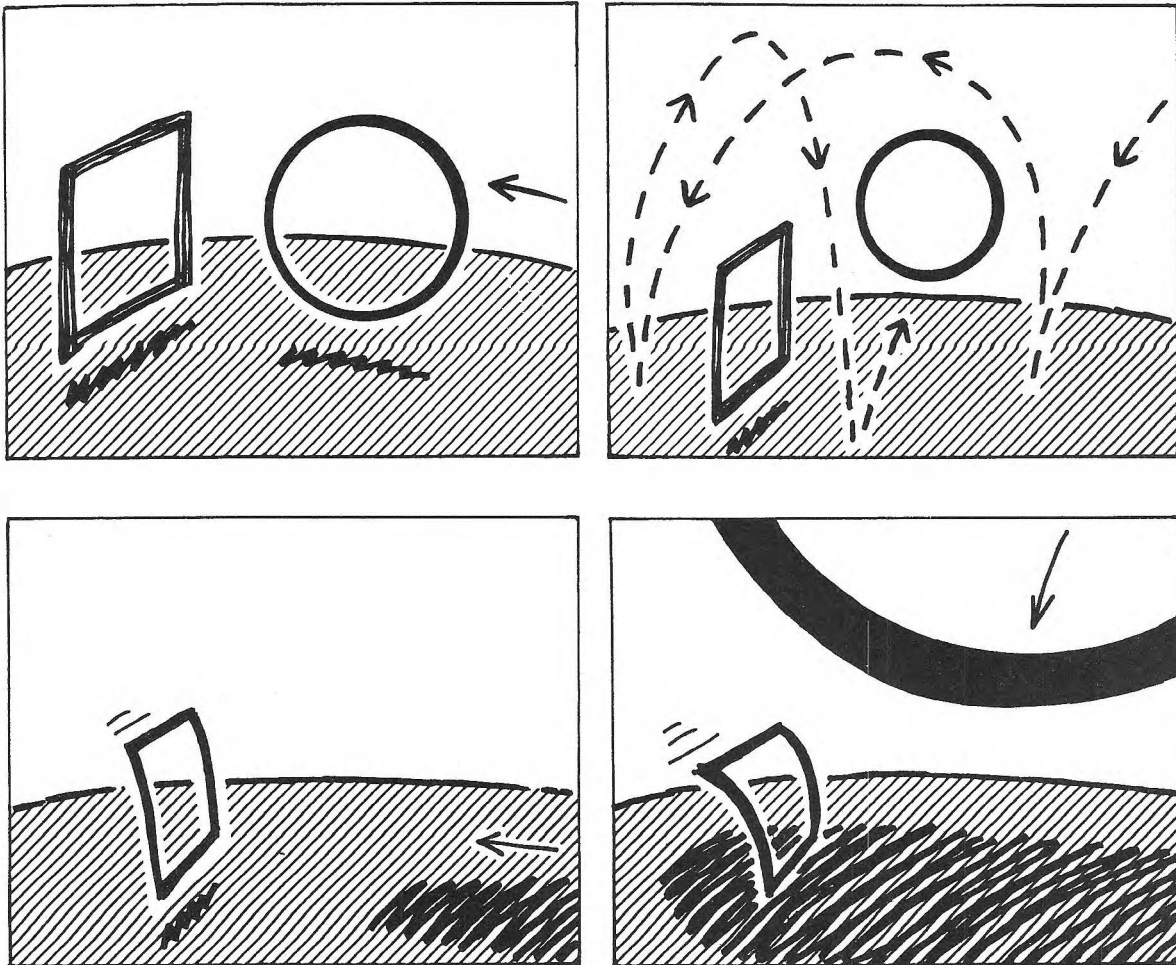
### ***The Layout***

The *layout* gathers everything that is going to happen into one scene. Like the layout for a still picture, the layout for an animation is a spatial design, indicating the relative size of elements, their placement, foreground, background, and the typeface and size of text.

The layout for an animation deploys the moving elements. By including the trajectory each moving element takes, you'll see where and when two objects pass or collide. When text scrolls on, you can make sure it doesn't obscure an object, unless it's designed to do so.



Another common term for layout is *staging*, which suggests the careful choreographing of actors' movements in a play.



*Trying Different Layouts for a Square Meeting a Circle*

A successful layout provokes the appropriate emotional reaction. For example, suppose you are animating a fable about a square meeting a circle. A first attempt at a layout might have the square move from the left, the circle enter from the right, and their paths coincide. The result is not very exciting. A more lively layout could have the circle bounce in suddenly and continue bouncing around the square. Another dramatic layout could reveal the circle descending

auspiciously from the heavens. If your aim is to suggest a romantic mood, you'd go on experimenting.

Experienced animators will find that the Animator program offers flexible and direct methods for altering the size and placement of elements on screen, including scanning in variations and moving elements about as cels. These are covered in later chapters.

## Drawing a Layout

In the next exercise, you'll lay out a rural scene. The static objects consist of a house, pond, hills, and the sun in the upper right-hand corner. The moving element is a cloud that moves to the right and covers the sun.

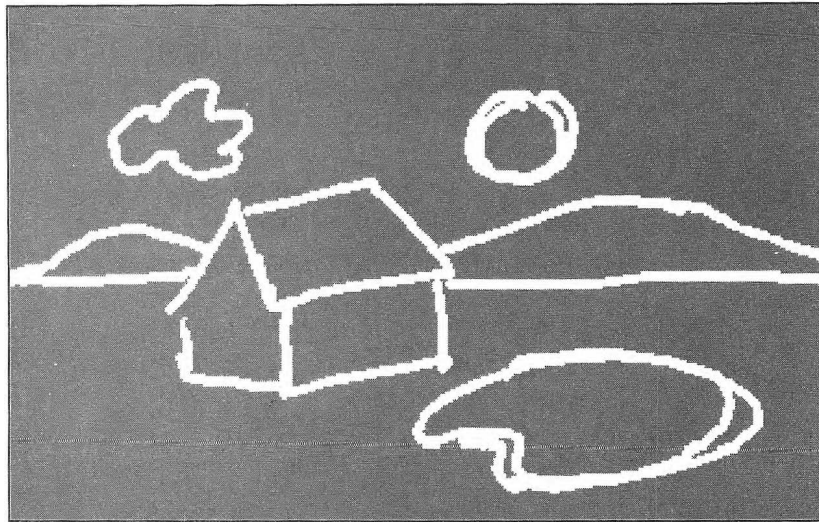
You'll change the key color (the color in the slot to the left of the mini-palette) to gray for the background. Then you'll draw the layout in white using a brush four pixels wide.

---

### Drawing a Layout

<i>Open</i> <b>FLIC</b> <i>Select</i> <b>RESET</b>	
<i>Click</i> <b>YES</b>	Or type <b>FRY</b> to restore defaults.
<i>Right click</i> <b>cluster</b>	Displays palette panel.
<i>Click</i> <b>[A]</b>	Selects gray-scale cluster.
<i>Right click</i> <b>screen</b>	Or press <spacebar> to return to home panel.
<i>Right click</i> <b>key color</b>	Highlights key color slot, indicating it's selected for changing.
<i>Click</i> <b>cluster</b>	<i>Pick</i> a medium gray shade as key color.
<i>Click</i> <b>key color</b>	Selects key color as current color.
<i>Open</i> <b>PIC</b> <i>Select</i> <b>APPLY INK</b>	Changes background color to the gray shade.
<i>Click</i> <b>mini-palette</b>	<i>Select</i> white color in mini-palette as current color.
<i>Click</i> <b>brush</b>	Toggles brush to default larger size, 4 pixels wide.
<i>Right click</i> <b>screen</b>	Displays entire screen.
<i>Use</i> <b>DRAW</b>	<i>Sketch</i> house, pond, and hills, with cloud at upper left and sun at upper right.
<i>Right click</i> <b>screen</b>	Or press <spacebar> to restore menu bar and home panel.

---



*Sketch for Layout*

You should now have a scene drawn in white on a medium-gray background. Such a background color contrasts well with a wide palette of dark to light colors. It also lets you use drop shadows and white lettering in the same picture.

**TIP** *Sketch the layout in a color that you won't be using normally in your work. That way, you'll be able to recognize it as a preliminary sketch even if, as is likely, you've prepared quite a few similar drawings for the project.*

*Should you later want to incorporate part or all of the layout into the animation, you can quickly replace that color with opaque ink, using the separate tool to select a color on screen to be replaced wherever it occurs.*

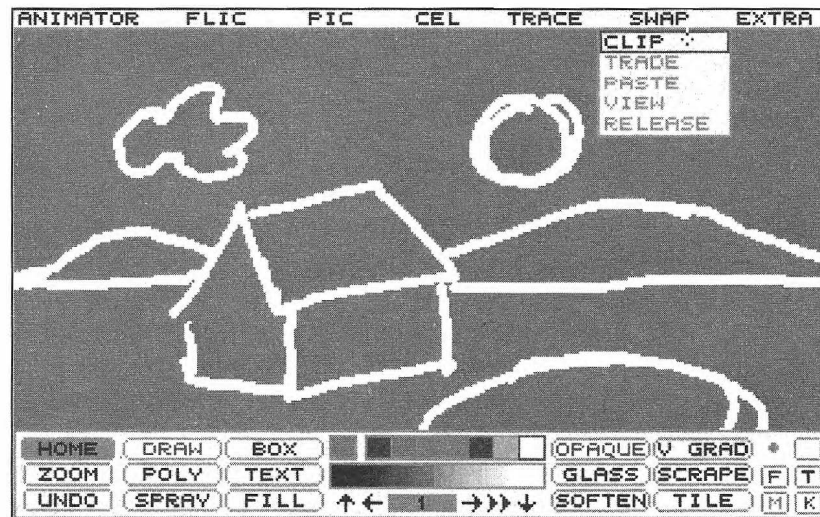
## Editing the Layout

Once you have the layout on screen, you can experiment to improve it. Perhaps the design would be more balanced if there were a second cloud, or the pond would fit more harmoniously into the landscape if it were a slightly different shape. You can fiddle with the layout until you're satisfied, but before you make any changes, it's a good idea to put a copy of the original where you can easily retrieve it.

### *The Swap Screen*

The swap screen is a temporary storage buffer that holds one frame at a time. If you make a change to your layout and then later decide it was a change for the worse, you can quickly reverse it.

When you select CLIP on the SWAP menu, the contents of the main screen are transferred to the swap screen. If you then clear the main screen or merely change the drawing, you can get the original back from the swap screen. Other options on the SWAP menu let you look at the swap screen (VIEW), switch the main screen and swap screen (TRADE), and replace what is on the main screen with what is on the swap screen (PASTE).



*SWAP Menu, CLIP Selected*

Next, you'll copy the screen to the swap buffer, try some changes, and compare them to the original.

### **Swapping Screens**

Open **SWAP** Select **CLIP**  
Use **DRAW**

Copies image displayed on main screen to swap screen.  
*Sketch* a second cloud below and to the right of the first cloud.

Open **SWAP** Select **VIEW**  
Right click **screen**

Or type **SV** to compare changed layout with swap screen's layout.  
Or press <spacebar> to return to main screen.

---

<i>Right click screen</i>	Or press <spacebar> to display entire drawing area again.
<i>Use DRAW</i>	<i>Sketch</i> over part of pond to create a slightly different shape.
<i>Type SV</i>	Displays swap screen again.
<i>Right click screen twice</i>	Or press <spacebar> twice to return to main screen and home panel.

---

The keyboard shortcuts, such as typing **SV** in the exercise above, are usually faster than menus, particularly when the entire screen is displayed without the menu bar or home panel. You don't have to see the menu bar to use keyboard shortcuts.

**TIP** *Put a colored dot on the image you clip to the swap screen. Then, when you view the swap screen or trade it with the main screen, you'll know instantly which version is displayed.*

What can you do if, after viewing the swap screen a few times, you decide the layout was better without the second cloud? Trading or pasting the swap screen doesn't allow you to keep some changes and wipe out others. Putting back the original image means just that — all changes are gone.

### ***Erasing With the Key Color***

There's an easy way to remove the second cloud without disturbing the rest of the layout: paint over the cloud with the background color as if you were using an eraser. A number of the drawing tools can do this, applying opaque ink with greater or lesser control. For example, to cover a large area quickly, you might use the draw tool with a wide brush or the spray tool with a wide setting.

In the next exercise, you'll use the box tool to surround the area you want to paint out. To delineate a box that encompasses the unwanted cloud, click to set one corner of a rectangle, move the cursor to the opposite, diagonal corner of the rectangle, and click again to set it.

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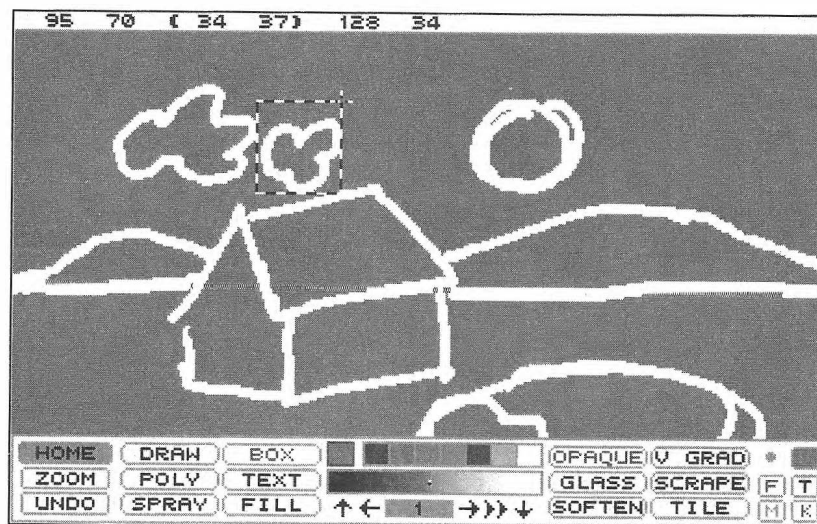
### **Painting Over Part of the Screen**

<i>Click key color</i>	Selects key color as current color.
<i>Click BOX</i>	Changes to the box tool.

---

<i>Click screen</i>	<i>Set lower left corner of rectangle just below and to left of second cloud.</i>
<i>Move cursor Click screen</i>	<i>Set upper right corner of rectangle just above and to right of second cloud.</i>

---



*Setting Two Corners of Rectangle to Erase Cloud*

The area within the rectangle has been painted with the opaque key color, and the cloud is now covered over with the background color. Obviously, this method is successful only when the area to be covered over is surrounded by one opaque color.

**TIP** *Not only while you are doing a layout, but as a general practice, you should save versions of a work-in-progress so that you are mainly concerned with keeping the most recent changes. If you get in the habit of doing this, you can use other methods to remove unwanted changes, such as UNDO and PIC RESTORE, in addition to the scrape tool which is described next.*

### ***Scrape Ink Reveals the Swap Screen***

Scrape ink is useful for restoring a portion of your drawing to its original state. Instead of painting over something you've added, you remove the paint from an area of the main screen, revealing the layer beneath on the swap screen.

It would be difficult to erase the additional lines you sketched around the pond without erasing lines you want to keep. You can, however, scrape off a bit here or there and continue adjusting the shape of the pond. In the following exercise, you'll use the box tool again to delineate the area to be scraped.

---

### Scraping the Surface

<i>Click</i> <b>SCRAPE</b>	Changes to scrape ink.
<i>Right click</i> <b>screen</b>	Displays entire screen, so pond is completely visible.
<i>Use</i> <b>BOX</b>	Set two corners of rectangle surrounding portion of pond to be restored.

Display menu bar and home panel again.

---

As you can see, scrape ink reveals the portion of the swap screen beneath the boxed area of the main screen. The current color has no effect. Different tools scrape differently: the draw tool scrapes off only the area beneath the brush, the spray tool reveals what is beneath each dot of spray, and so on.

### Testing Movement

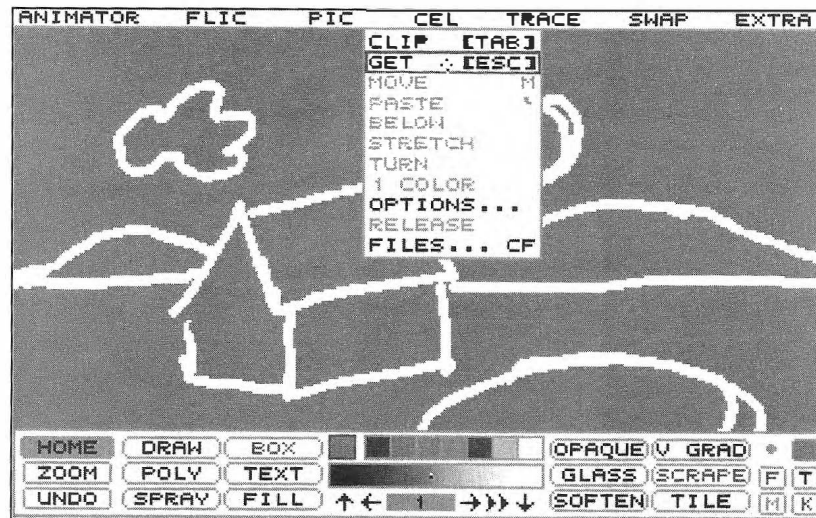
According to the layout, the cloud is going to move across the sky until it covers the sun. You have several choices for accomplishing such a movement. You can depict the path on the optics panel, create a metamorphosis by means of polymorphic tweening, even draw each frame by hand, moving the cloud a little farther in each succeeding frame. You can also choose the pacing of the movement: the cloud can sail majestically, it can flutter prettily, or it can scud across the sky picking up speed and threatening a storm. All of these movements are covered in later chapters.

For now, you'll try one of the simplest methods, which is pasting the cloud to each frame of a flic while the program calculates how much the cloud moves from frame to frame. To do this, you need a *cel* of the cloud — a portion of the screen you've selected so you can manipulate

it separately. Chapter 5 is a full discussion and tutorial on using cels in Animator.

### *Getting a Cel*

To clip only a portion of the screen as a cel, select GET on the CEL menu and set two diagonal corners of a rectangle, as you do to use the box tool. The area within the rectangle is copied to the cel buffer, a temporary storage area for cels. Like the contents of the swap screen, the contents of the cel buffer cannot be seen until you bring a cel back to the main screen.



*CEL Menu, GET Selected*

Next, you'll copy the cloud into the cel buffer and then erase the original.

### **Getting the Cloud**

*Open CEL Select GET*

*Click screen*

*Move cursor Click screen*

*Click OPAQUE Use BOX*

Or press the <escape> key to get a cel.

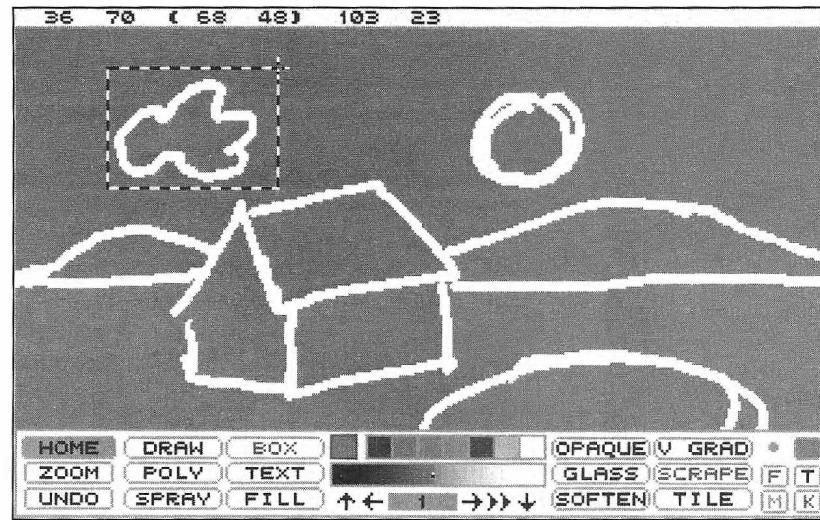
*Set first corner of rectangle at lower left of cloud.*

*Set second corner of rectangle diagonal to first, encompassing cloud to define cel.*

*Set two opposite corners of rectangle to paint over cloud with key color.*



The cloud has now been copied to the cel buffer. You'll bring it back when you're ready to animate it. If the original cloud were not removed, it would remain stationary while the cel duplicate of the cloud moved across to the sun.

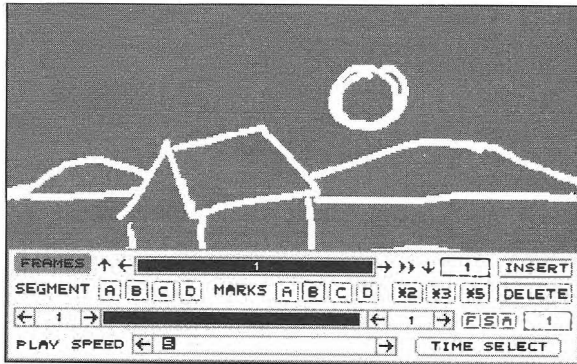


*Getting the Cloud*

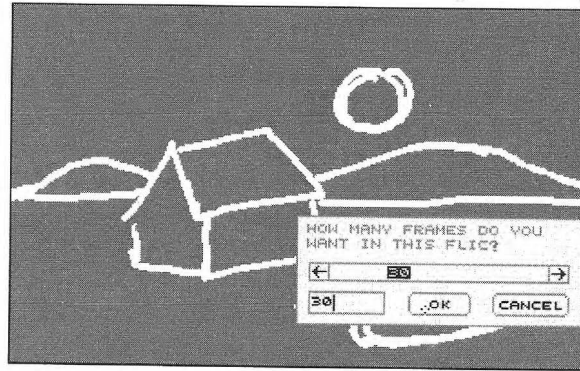
### ***Creating Frames for a Flic***

When you create frames for a flic, the current drawing on screen is pasted to each frame. If you want to start with blank frames, clear the screen first. In this exercise, you want to paste the drawing on screen to each frame, because it will become the background for the flic.

**TIP** *When you have a drawing on screen that you want to use on just one frame of a flic, put it on the swap screen and clear the main screen before making a range of blank frames. Then trade one blank frame for the swap screen.*



Frames Panel



Dialogue Box, 30 Frames Set

In the next exercise, you'll set up the frames for a flic to animate the cloud. To create the number of frames you need, display the frames panel by right clicking on any frame control icon (any of the arrows, or the current frame box and number) on the home panel, or by selecting **FRAMES** on the **ANIMATOR** menu. Then right click on the large total frames box on the frames panel, which is just to the right of the frame control icons. In the dialogue box that is displayed, you can either drag the slider to the number of frames desired or type the number. Numbers larger than 100 can only be typed in. After setting the number of frames, either click on **OK**, right click, or press the **<spacebar>** to return to the home panel.

---

### Creating Frames for a Flic

<i>Right click frame control icon</i>	Any arrow icon or the current frame box displays frames panel.
<i>Right click total frames box</i>	Displays dialogue box for setting number of frames in a flic.
<i>Press &lt;backspace&gt;</i>	Clears number in box at lower left.
<i>Type 30</i>	
<i>Click OK</i>	Or <return> to accept it, and display frames panel again.
<i>Return to main screen and home panel.</i>	

---

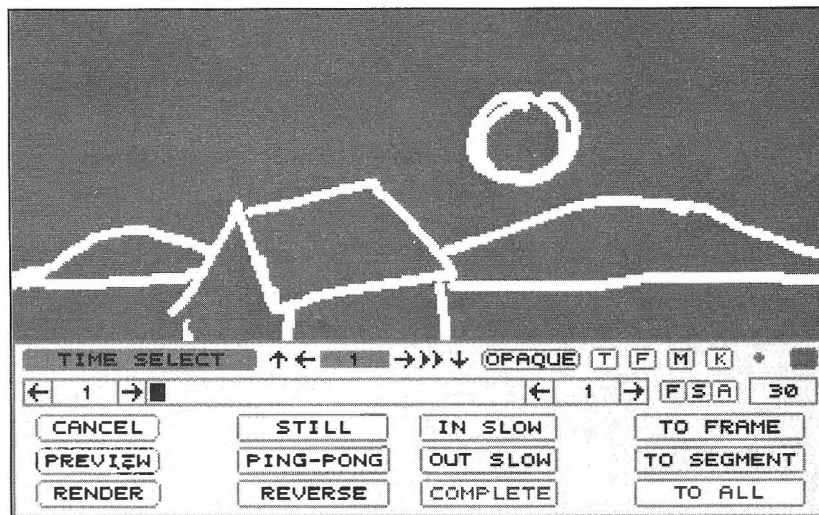
**TIP** *If you want to avoid having to set up frames for a flic when you're just testing movements, you can change your DEFAULT.FLX file (as explained in Chapter 1) so that you always start up with a suitable number of frames, 20 for example. If you do this, however, you'll need to adjust the number later when you know how many frames a particular flic requires.*

Forgetting to create the frames for a flic is a common error. Especially when editing a moving element in a flic, you should remind yourself to clear out the old animation first and make a new set of frames before trying to apply the movement again.

### ***Pasting a Cel to a Sequence of Frames***

Now that the background scene is on each frame of the flic, you can paste the cel of the cloud. To make the cloud move from its original position across the screen until it blocks the sun, you turn on the [T] button on the home panel. The [T] button is a toggle for time mode. When the [T] button is highlighted, certain operations can be applied over a sequence of frames. Pasting a cel is one of these. If you wanted to paste a cel to one frame only, you would not turn on the [T] button — and you would turn it off first if it were on.

To paste a cel on one frame, click anywhere on screen to pick it up. Then move the cursor until the cel is where you want to paste it. With the cel in place, click again to indicate the location to paste it. Pasting a cel over a sequence of frames is the same procedure; however, the cel moves from its original position to the final position in the course of the flic.

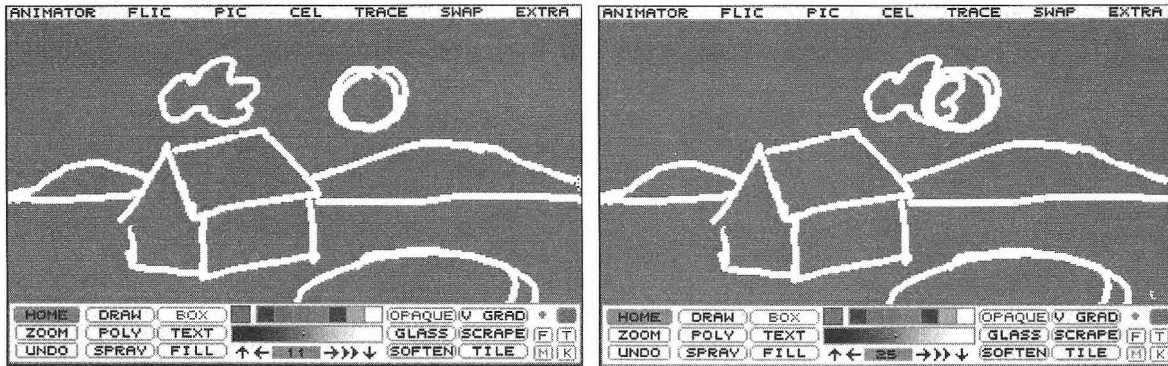


*Selecting PREVIEW on the Time Select Panel*

When you paste a cel over a sequence of frames, the time select panel appears after you indicate the final position. On this panel, you can preview the motion and, if it seems ready, render it. Until you render the paste, it isn't in the flic.

## Pasting the Cloud in Motion

Click [T]	Turns on time mode.
Open CEL Select <b>PASTE</b>	Cloud appears in original position, surrounded by dashed rectangle.
Click left side of <b>screen</b>	Picks up cel to move it.
Move <b>cursor</b>	Move cloud <del>across</del> until it's on top of sun.
Click <b>screen</b>	Sets final position.
Click <b>PREVIEW</b>	
Right click <b>screen</b>	Returns you to time select panel.
Click <b>RENDER</b>	Applies motion to each frame of flic, then returns you to home panel.
Click <b>play icon</b>	The double right arrow icon plays the flic.
Press <spacebar>	Or right click to stop the flic.



*Cloud Moving Across to Sun*

## Setting Up Files for a Project

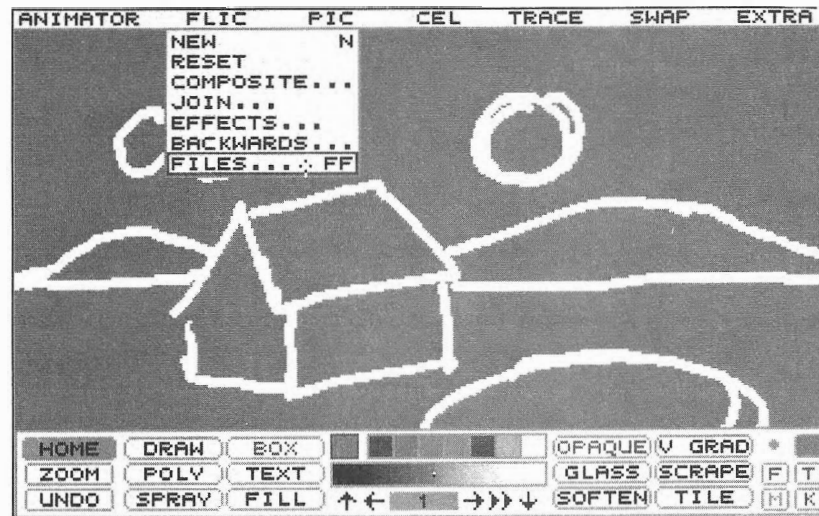
An animation project is likely to entail a large number of Animator files before it's done. Even a short, simple animation can lead to several versions of the layout, experimental flics, cels of moving elements — all of which may be worth preserving on disk until final decisions are made. For a more complex animation, there may be groups of files for different scenes and for different characters, in addition to text files, optics files, and perhaps a macro file to speed up saving the other files.

Animator filenames adhere to DOS rules. That is, they can be up to eight characters long and may include numbers, hyphens, and the other extended characters allowed in DOS. The program adds the appropriate file extension. Moreover, the program can automatically number a group of files sequentially, which is most useful in tracking changes along the way.

It's well worth thinking about a generic, easy-to-decode name for all the files in a project before they begin to accumulate. If, for example, the animation presents the Eden Estates subdivision to prospective home buyers, the files could be named EDEN.FLIC, EDEN.GIF, EDEN.TXT, and so on. A sequence of files might be named EDEN01.CEL, EDEN02.CEL, EDEN03.CEL, continuing to the end of the sequence.

### ***Saving Files***

Saving any Animator file is much the same, no matter the type of file. Select the files panel for the type of file you want to save. For example, when you want to save a GIF file, you open the PIC menu and select FILES. The files panel is then displayed with PICTURE already highlighted. The FILES item appears on the FLIC menu for FLI files, on the CEL menu for CEL files, on the MASK menu for MSK files, and so on. You can also type the initials from the keyboard (PF for PIC FILES, FF for FLIC FILES, and so on.)



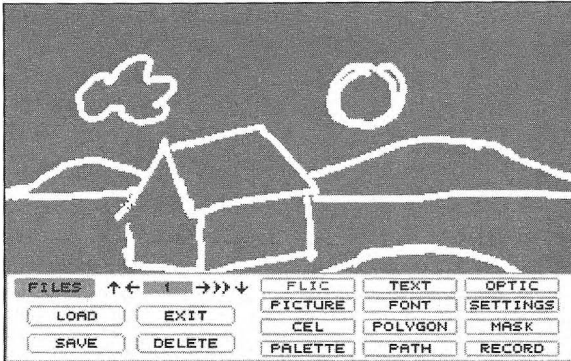
*FLIC Menu, FILES Selected*

Once the files panel is displayed, select the action to be performed — saving, loading, or deleting a file of the type that is highlighted. You can also select a different file type from the files panel, then perform the file operation when the file selector appears.

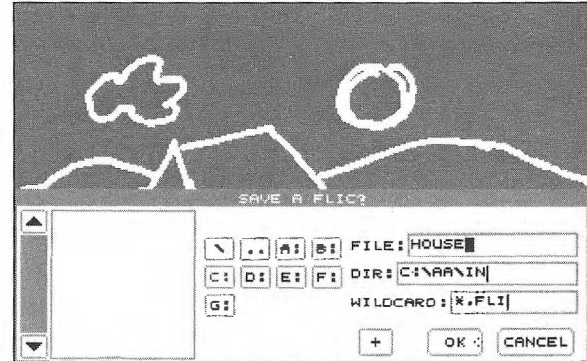
You can change the drive or directory you will be saving your file to by using the drive buttons, such as [A:] and [C:], and the directory buttons, [...] and [\\], which are located to the right of the file selector window. There is a button for each drive on your system, including one for your RAM disk drive, if you have one.

The current drive is highlighted. To select another drive, click on its button. For example, if [C:] is highlighted and you want to save a file to drive D, click on [D:] to change to that drive. The directory buttons

move you up in the directory structure. Click on [...] to move up one directory level closer to the root directory. Click on [\] to move directly to the root directory. To move down in the directory structure, click on the directory name box (to the right of DIR:) and enter the desired name.



*Files Panel, FLIC Highlighted*



*File Selector Set to Save Flic*

When the drive and directory are correctly set for your file, enter the filename, either by selecting it from the window if it already exists, or by typing it in. If you need to edit the name, press the <escape> key when the large block cursor is on the filename line to remove the name entirely. Pressing the <backspace> key erases the character immediately to the left of the cursor.

### ***Saving a Flic***

In the next exercise, you'll save the flic you just created. If you set up the IN subdirectory and saved the DEFAULT.FLX file as instructed in Chapter 1, the default drive and directory for the file selector should be C:\AA\IN each time you reset the program. Because you reset the program at the beginning of this chapter, the default should be in effect. If that is not the case, you'll need to use the drive and directory buttons to change to the \AA\IN subdirectory before saving the file.

---

### **Saving a Flic**

Open **FLIC** Select **FILES**  
Click **SAVE**

Displays files panel with FLIC selected.  
Displays file selector, set for saving FLI files.

Press <escape>	Clears default filename, UNTITLED.FLI.
Type house	Names flic.
Click OK	Saves flic.

---

To save any other type of Animator file, follow the same procedure, choosing the appropriate file type on the files panel. Choose LOAD or DELETE instead of SAVE to perform those file operations.

### ***Saving Multiple Versions of a File***

When a project calls for more than one moving element, you can save each as a separate cel file. In the next exercise, save the cloud as the first in a potential series of cel files.

To save a cel file from the main screen, you select FILES on the CEL menu. However, when the files panel is already displayed, you can go directly to the file selector.

---

### **Saving a Cel**

Click CEL	Changes file type on files panel.
Click SAVE	Displays file selector for saving cel files.
Click [+]	Saves cel with filename HOUSE01.CEL. You can click SAVE again to verify it.

---

As you just saw, the filename the program automatically supplies is the same as the last file saved, with the CEL extension. This is convenient for overwriting a file you've updated and for saving several files that all belong together, such as a drawing (GIF) file, the special palette for that drawing (COL) file, its settings (SET) file, and so on.

When necessary, the program cuts off the end of the filename to make room for the numbers within the eight-character limit. Had the generic filename been DOMICILE, instead of HOUSE, the cel would have been named DOMICI01.CEL, which might not be as recognizable in a directory listing. It's a good idea to limit filenames to six characters, leaving the last two for numbers.



**TIP** *If you're ever uncertain that the file has been saved with the correct filename, just click on **SAVE** again, check the file selector's listing, and click on **CANCEL**.*

### ***Saving the Swap Screen Picture***

The swap screen buffer is for temporary storage only; its contents are cleared when you clip another frame. If you don't want to lose the contents of the swap screen buffer, you can bring the frame back to the main screen and save it as a picture file.

The picture currently on the swap screen (the original sketch for the layout) will be used again in Chapter 5. If you have the IN DISK, it's the file HOUSE01.GIF. If you don't have the IN DISK, you need to do the following exercise to bring the picture back to the main screen and save it as a GIF file. The files panel should still be displayed.

---

### **Saving the Swap Screen**



Skip this exercise; you have the house file on the IN DISK as IN05HOUS.GIF.



Save the swap screen as instructed below.

Click **PICTURE**

Changes file type on files panel.

Click **SAVE**

Displays file selector for saving picture files.

Click **OK**

Saves file with previous filename (HOUSE01) and GIF extension.

Return to home panel.

---

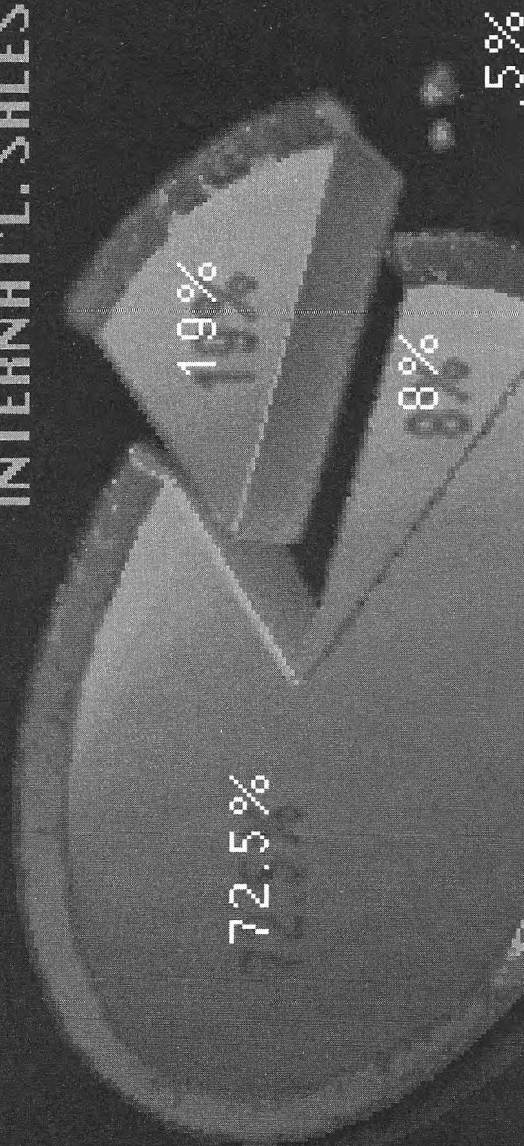
## **Next Steps**

This chapter has stressed how to think through a project as you begin to get it under way. Although each project has its own demands, taking time to do a storyboard and to experiment with the layout can help you steer clear of obstacles, pitfalls, and snags later on.

The next chapter introduces Animator's large array of tools and inks. Unless you have the IN DISK, make sure you saved the picture of the layout (HOUSE01.GIF) to use again in Chapter 5 and the flic (HOUSE.FLI) to use again in Chapter 6.

# FLAKEY PASTRIES

## INTERNAT'L. SALES



*Pie Chart for Flaky Pastries*

# So Many Tools, Even More Inks

Animator tools and inks are mathematically, as well as visually, impressive: any of the 22 tools can be used with any of the 26 inks for a total of 572 combinations. In practice, you'll turn to certain tools and inks constantly, others less often. But if you keep in mind the manifold possibilities, you'll discover exciting new imaging effects.

The draw tool and opaque ink are the workhorses, of course. Every time you reset the program, the draw tool is back in the first tool slot on the home panel and opaque ink is back in the first ink slot.

In the preceding chapters, you've already encountered the box tool, the spray tool, scrape ink, and v grad ink (one of the gradient inks). These are among the default tools and inks on the home panel. When you choose other inks and tools, they remain available on the home panel until you replace them or reset Animator.

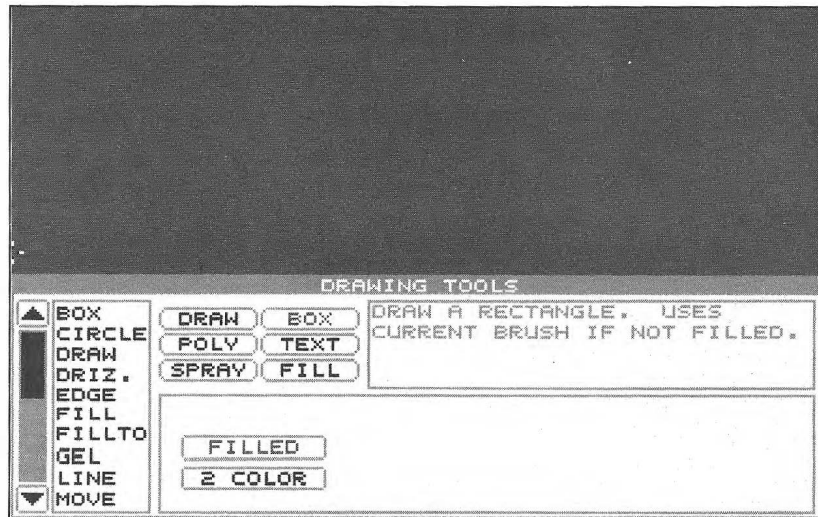
In the interest of preserving trees and your patience, not all 572 combinations of tools and inks are catalogued here. However, this chapter introduces a variety of tools and inks you'll probably use often. The exercises demonstrate how to work with them while creating a simple animated sales chart. With many programs, you can put together a sales presentation. With Animator, you can make it a moving sales presentation.

## The Drawing Tools Panel

You can keep six tools ready for use on the home panel. Right clicking on any of them displays the drawing tools panel, where you can adjust options or select different tools for the home panel.

**TIP** *Right clicking on a tool on the home panel is more efficient than selecting DRAW TOOLS on the ANIMATOR menu to display the drawing tools panel. However, be careful to right click on the tool you wish to replace or set an option for, not necessarily the one that's already highlighted. To avoid inadvertently replacing a tool you still need, check which tool is highlighted on the drawing tools panel before selecting a new one.*

The full complement of tools is listed alphabetically in the tool selection window at the left side of the drawing tools panel. You can scroll through the list by clicking on the scroll bar or on the up and down arrows. The six tools currently on the home panel are duplicated in the six tool slots, with a description of the highlighted tool in the upper right box. The bottom half of the panel displays options, if any, for the highlighted tool.



*Drawing Tools Panel, BOX Selected*

You can save a particular arrangement of tools on the home panel in a settings file (SET) and reload it each time you work on a particular project. You can customize your default arrangement also, by saving the DEFAULT.FLX file. To create and use a settings file, select SETTINGS on the EXTRA menu. To create a DEFAULT.FLX file, select CONFIGURE on the EXTRA menu, as explained in Chapter 1.

### *Changing an Option*

To set the options for the tools in the six tool slots, display the drawing tools panel. First, click on a tool to highlight it. You can then decide how you want its options set. Click on an option to turn it on or off. If an option has a slider bar, set the slider to the appropriate number.

In the next exercise, you'll select the box tool and change one of its options. The box tool has two options: **FILLED** and **2 COLOR**. When **FILLED** is on, boxes are drawn as filled rectangles. When **2 COLOR** is also on, boxes are outlined in a second color in addition to being filled. By default, **FILLED** is on and **2 COLOR** is off.

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### **Changing an Option**

Type <b>fry</b>	Resets Animator, using keyboard shortcut.
Right click <b>BOX</b>	Displays drawing tools panel and highlights box tool.
Click <b>FILLED</b>	Turns off filled option.

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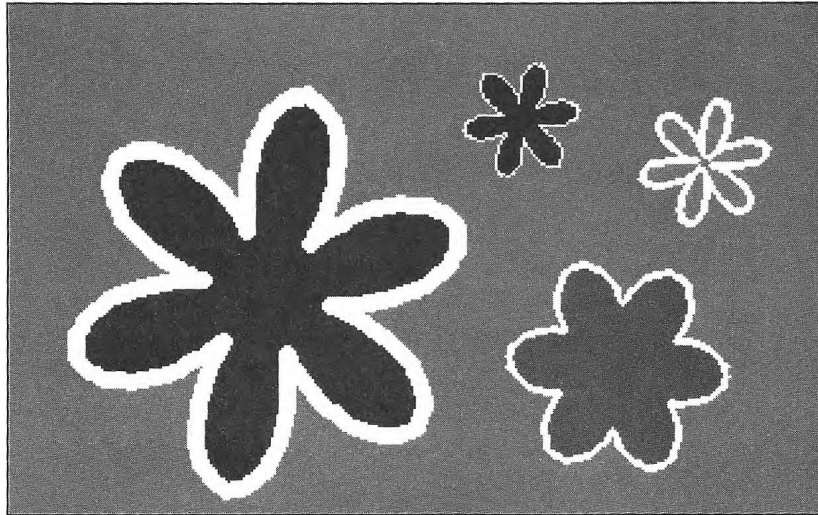
Now both options are turned off.

### *Setting **FILLED** and **2 COLOR***

The box tool shares its two options with a number of tools that form a closed shape, such as the petal tool, the oval tool, and the poly tool. Setting **FILLED** or **2 COLOR** for one tool sets it for all of them.

Another way to set **FILLED** is to click on the **[F]** button. If the **[F]** button is highlighted, **FILLED** is on. The **[F]** button is on the optics and time select panels, as well as the home panel. Wherever the **[F]** button appears, it indicates the current setting for all tools that share the filled option.

With **FILLED** turned on, shapes are filled with the currently selected ink. For example, petals may be filled with opaque ink, or with a horizontal gradient, or perhaps with glass ink, depending on the ink you've selected.



*Petals With FILLED and 2 COLOR Turned On*

When 2 COLOR is turned on, filled shapes are outlined in the current brush size, using the color in the far right slot on the minipalettes. However, if FILLED is turned off or if the shape is filled with one of the special inks (such as v grad), 2 COLOR has no effect. Since 2 COLOR is not possible unless FILLED is turned on, you can turn off both options at once by turning off the [F] button.

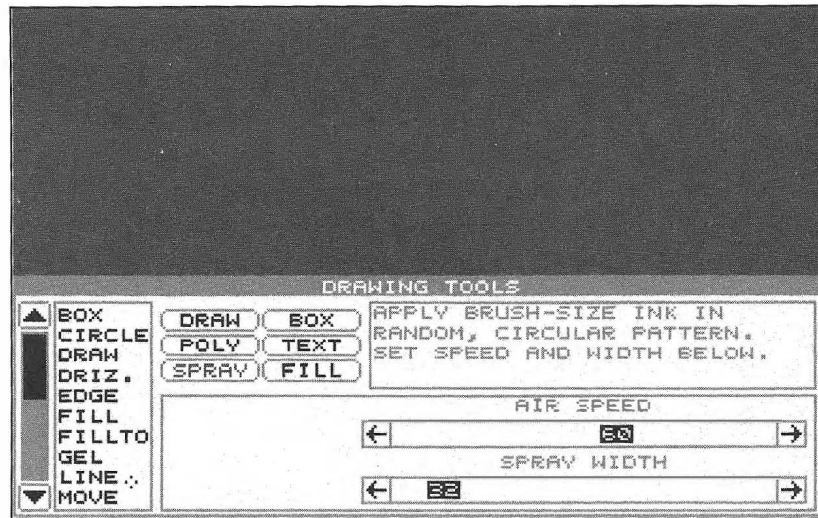
**TIP** *Choose either the filled option or the [F] button to draw a shape and color it in one step. Or use the fill tool to apply color within the outline of an existing shape.*

### ***Other Options***

Other tools have options unique to their purposes. For example, the text tool and the poly tool, which you'll explore later in this chapter, have a number of specialized options. Some tools, like the line tool, have no options. After all, a line is a line is a line.

The spray tool has two options you can adjust by dragging a slider: the speed of the spraying and the width of the pattern the spray makes on the screen. These options are unique to this tool. When you are experimenting, try dragging the sliders to different settings for the spray options and comparing the results. You can also adjust the brush size to determine the diameter of the individual dots of sprayed

ink. An interesting combination you might try is the spray tool and v grad ink.



*Line Tool Replacing Spray Tool*

### ***Replacing Tools***

For the sales chart you'll be creating in this chapter, you'll need the line tool on the home panel. The next exercise shows how to replace the spray tool, which you won't need, with the line tool.

---

#### **Replacing a Tool**

*Click* **SPRAY**

Highlights spray tool on drawing tools panel.

*Click* **LINE**

Selects line tool from tool window list.

*Right click* **screen**

Returns you to home panel.

---

You can follow this procedure to select any tool. If the tool isn't visible in the window, scroll up or down to locate it.

Back at the home panel, you can see that the six tools are now the same as those in the slots on the drawingtools panel. The line tool has

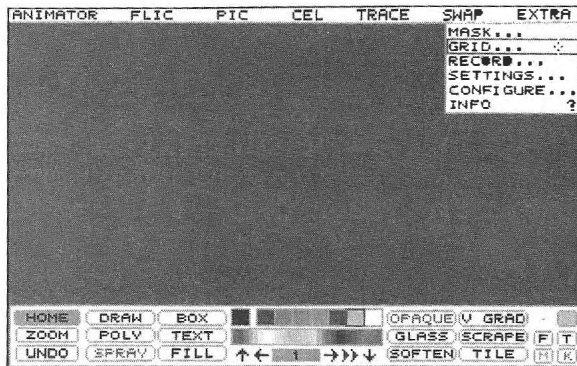
replaced the spray tool. Notice that the [F] button is off, indicating that the filled option is turned off for all the tools it affects.

## Aligning Elements With a Grid

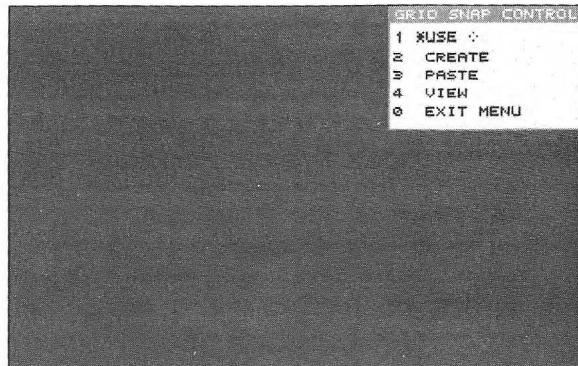
In designing a chart such as the one you'll create in this chapter, you'll want to decide on the best layout ahead of time. At the beginning of your project, it's important to analyze what is being compared, and what data should be most dramatically presented. For example, you'll plan how many columns of data are required, what increments are appropriate, where titles and legends should appear, and make decisions about the various kinds of text to put on a chart.

Using a *grid* lets you lay out and align graphic elements with precision. The GRID SNAP CONTROL submenu, reached by selecting GRID from the EXTRA menu, controls Animator's grid. You can define a grid of any horizontal and vertical spacing. The grid has two main functions. First, you can paste the grid on the screen, and use its horizontal and vertical lines to help you lay out your design. You will do this temporarily in the chart exercise which follows.

Second, you can snap lines and points to the grid's intersections. This is known as *grid snap*, and lets you be a little sloppier when you click on the screen because it forces all points to the grid. Grid snap can be used whether or not the grid is pasted on screen. To turn grid snap on, select GRID on the EXTRA menu and click USE. You can see the currently defined grid (without having to paste or use it), by selecting VIEW from the GRID SNAP CONTROL menu.



EXTRA Menu, GRID Selected



GRID Submenu, USE Selected



Each unit on the default grid is 8 by 8 pixels, a convenient size for matching the spacing of the default font, SYSTEM.FNT. You can make a grid with units appropriate to your project by selecting CREATE. Chapter 7 shows you how to create a custom grid and work with it.

In the next exercise, you'll change the key color so you can make the background medium gray, which allows both dark and light colors to show up well. If you have the IN DISK, load IN-CHP03.SET to change the key color.

---

### Changing the Key Color



Open EXTRA, select SETTINGS, and load IN03SET.SET. Then skip to the next exercise.



Do this exercise to change key color to medium gray.

*Right click cluster*

Displays palette panel.

*Click cluster button [A]*

Selects gray-scale cluster.

*Right click key color*

Prepares key color to be changed.

*Select cluster*

Pick a medium gray.

*Click key color*

Makes current color the new key color.

---

Now you'll change the background color to the new key color and try drawing lines with grid snap turned on. Then you'll paste the grid.

---

### Snapping to the Grid

Return to home panel.

*Open PIC Select APPLY INK*

Floods background with medium gray.

*Click mini-palette*

Pick light green as new current color.

*Open EXTRA Select GRID*

Or type EG to display GRID submenu.

*Click USE*

Turns on grid snap.

*Right click screen*

Exits GRID submenu.

Click **DRAW**

Type **x**

Draw some lines to see effect of grid snap.

Clears screen.

Open **EXTRA Select GRID**

Select **PASTE**

Press **<spacebar>**

Displays GRID submenu.

Pastes grid to screen in current color.

Exits GRID submenu.

---

Notice that an asterisk appears beside USE when grid snap is in effect. The grid was pasted in light green, the current color. Pasting the grid on top of the background aids in placing the lines and text for the sales chart. When you no longer need the grid, you'll use the separate tool to remove it without disturbing the chart.

Many tools behave differently while USE is on. As you just saw, you can't use the draw tool for freehand drawing while using grid snap, but can only produce vertical, horizontal, and diagonal lines with end points on the intersections of the grid. The other tools you'll use to construct the chart — the box tool, the line tool, the text tool, and the poly tool — all snap to the grid.

**TIP** *With grid snap turned on, even spacing between cels in a series of moves is guaranteed.*

## Placing Elements With Status Line Coordinates

Often, you need to place a shape precisely but not necessarily aligned with a grid. Many tools display information on the status line that indicates where a shape will be drawn. The box tool is one. As soon as you set the first corner of the rectangle for a box, the status line appears in place of the menu bar, displaying information about the size and location of the rectangle. For example, if the status line displays 72 32 (89 49) 160 80, it's telling you:

- The X and Y coordinates of the first corner. In this case, 72 pixels right and 32 pixels down from the upper left corner of the screen.
- The number of pixels along the X and Y axes, including both start point and current position. The above example describes a box 89 pixels across and 49 pixels high.

- The X and Y coordinates of the cursor's current position. In this case, the cursor's position in pixels is 160 right and 80 down from the upper left corner of the screen.

Other tools that display the same status line information as the box tool include the move tool, which marks off a portion of the screen to be relocated, and the editing box for the text tool, which defines the limits of the area where text is pasted. Also, when you move or paste a cel, the cursor's coordinates appear on the status line before you set the first corner.

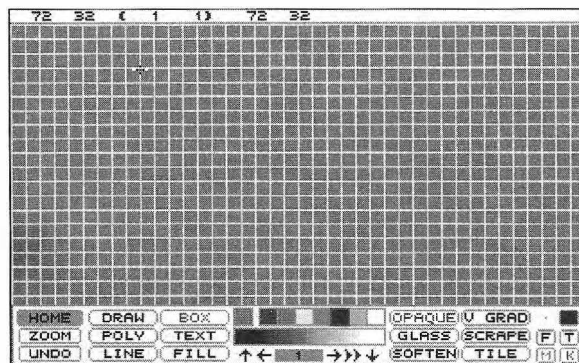
Some tools, such as the line tool and the spiral tool, provide even more information on the status line. In addition to the coordinates and sizing, you can read the angle up from the starting point and the length of the radius or line.

However, the status line does not provide information for all tools. For example, it doesn't display indicators about location or radial length when you use the circle tool or the oval tool.

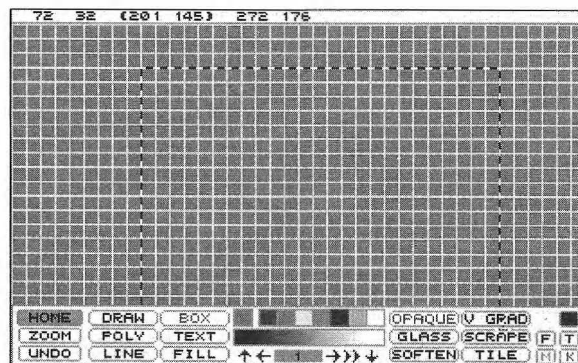
**TIP** *The status line doesn't display the first corner coordinates until after you pick the first corner. When you know the coordinates you want to set for the first corner of a box, click anywhere on screen and move the cursor until the last set of numbers on the status line gives you those coordinates. Then right click to cancel that box, and click again without moving the cursor to set a new first corner at that location.*

### ***Placing a Rectangle***

You'll start constructing the sales chart by using the box tool to draw the rectangular outline. The status line information indicates when the rectangle is correctly positioned.



*Status Line Coordinates for First Corner of Box*



*Status Line Coordinates for Second Corner*

Although your cursor extends into the home panel, Animator draws the following box under the panel. You'll see all of the box when you display the entire screen.

---

## Placing a Rectangle

Click **mini-palette**  
Click **BOX**

*Pick dark red as current color.*

Click **screen**

*Set first corner 4 squares down and 9 right of upper right screen corner. (The status line covers the first horizontal row.)*

Check first set of numbers on status line. If not 72 32, right click to cancel and try again.

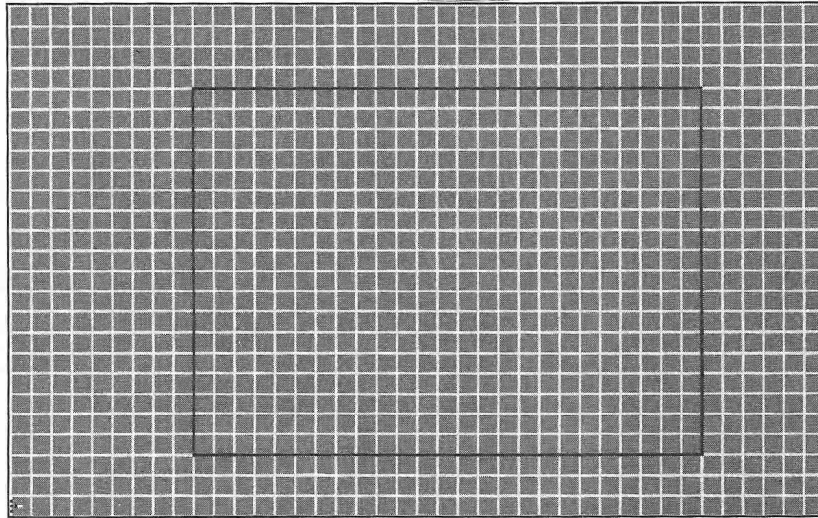
Click **screen**

*Set second corner when right-hand numbers on status line read 272 176.*

Right click

*Or press <spacebar> to display the entire screen.*

---

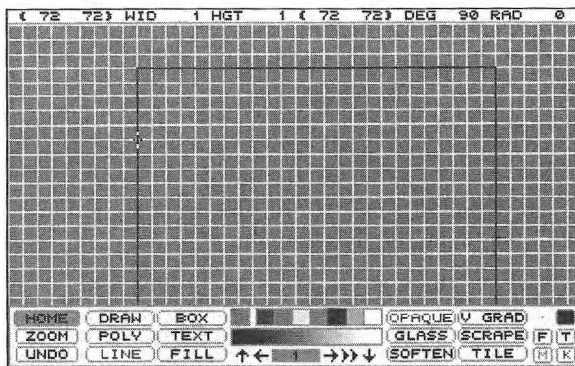


Outline of Chart

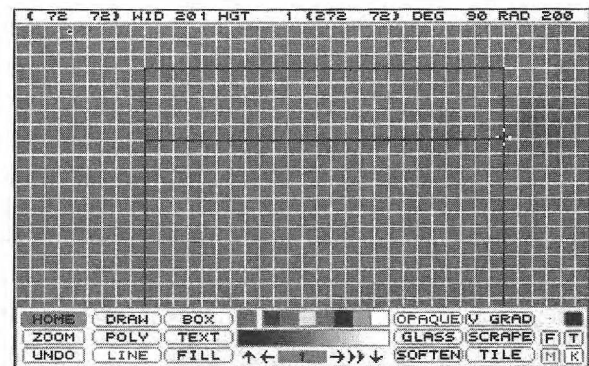
**TIP** *The nature of the material that a chart presents may give you ideas for interesting shapes other than rectangles. The pie chart illustration at the beginning of this chapter is a good example.*

### Placing Lines

Placing a couple of horizontal lines on the chart breaks up the space and provides visual references for comparing data.



Setting Start Point of First Line



Setting End Point of First Line

The line tool's status line is a bit different from that of the box tool. In the second illustration above, the (72 72) and (272 72) are the starting and ending points. The width is shown as WID 201, and the

height is HGT 1. The angle is shown as DEG 90, with 0 degrees being straight up, and the radius or length of the line is shown as RAD 200.

Refer to the illustrations above and consult the status line while doing this exercise.

---

### Placing a Line

*Display* home panel again.

*Click line Click screen*      *Set* start point on left side of rectangle 5 squares down from top.

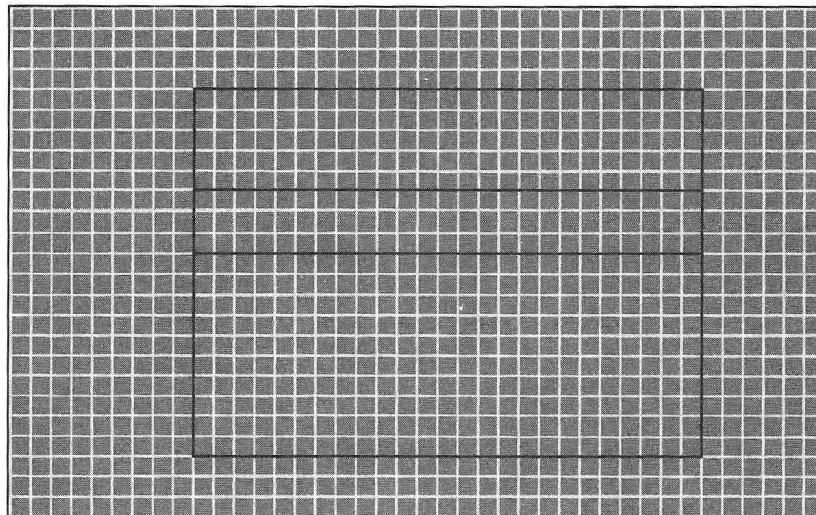
Check first set of numbers on status line. If not (72 72), right click and try again.

*Click screen*      *Set* end point on right side when second parentheses reads (272 72).

Repeat procedure to place second line three squares below first one.

*Type pfs*      *Save* your work as CHART01.GIF in the \AA\IN directory.

---

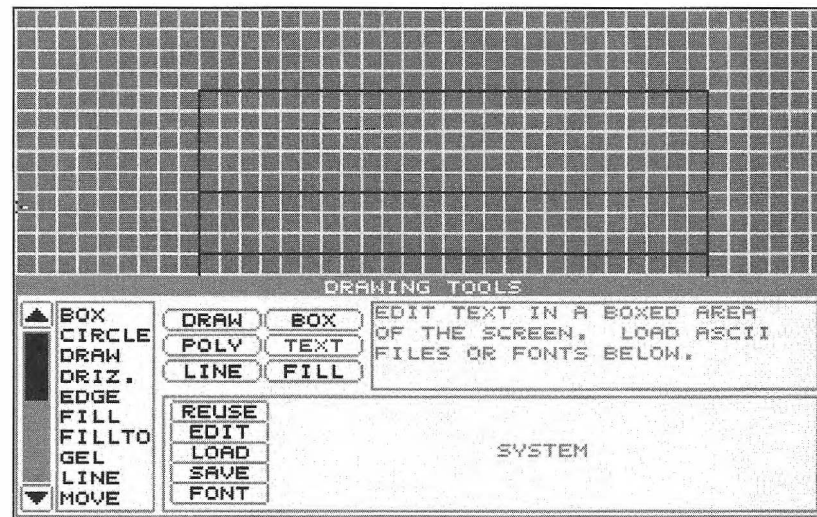


*Two Horizontal Lines on Chart*

Having safely preserved your work, you can take a break before continuing with the next exercise, if you like.

## The Text Tool

The text tool is one of the more complex Animator tools. Although this chapter introduces the text tool for numbering and labeling the chart, it merits its own chapter (Chapter 6) to fully cover its features. Further animation effects with titling are illustrated in Chapter 9.



*Text Options on Drawing Tools Panel*

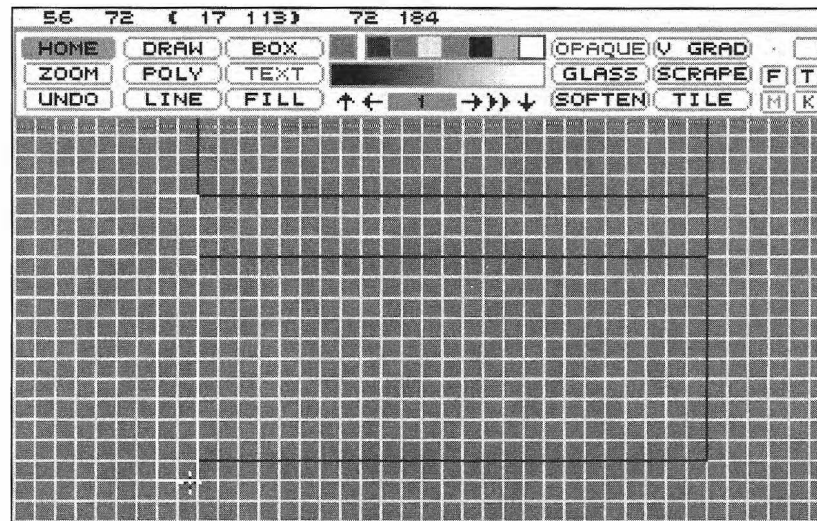
You won't need to change any text tool options for the following exercises. You'll simply put numbers along the chart's left side and months along the bottom, all in the default font.

To use the text tool, first set two diagonally opposite corners of a rectangle, just as you do with the box tool. This rectangle is called the *editing box*. Right clicking cancels the rectangle; clicking completes it. Then enter the text.

Once you've entered text, you cannot cancel. Right clicking pastes the text. You can, however, immediately select UNDO to remove the text and start over.

### *Aligning Text Vertically*

The text cursor always starts at the top left of the editing box, so in the next exercise, you'll place the numbers down the side of the chart starting with the highest number. To increase legibility, leave a blank line between each number. The grid helps you align the editing box with the first horizontal line on the chart. Moving the home panel up to the top of the screen, so most of chart is visible, gives you room to work on the chart.



*Setting the Editing Box*

---

### **Aligning Text Vertically**



Load the CHART01.GIF picture from previous exercise, and IN03SET.SET settings from the IN DISK.



Continue from the previous exercise.

Click **HOME** Move cursor  
Click **screen**

Move home panel up to just below menu bar.  
Sets home panel in new location.

Click **mini-palette**  
Click **TEXT** Move cursor

Pick white as new current color.  
Set first corner of editing box at 56 72 on first set of status line numbers.



**Click screen** Set second corner of editing box at 72 184 on last set of status line numbers.

**Type 60 Press <enter> <enter>** Enters text and leaves blank line below 60.

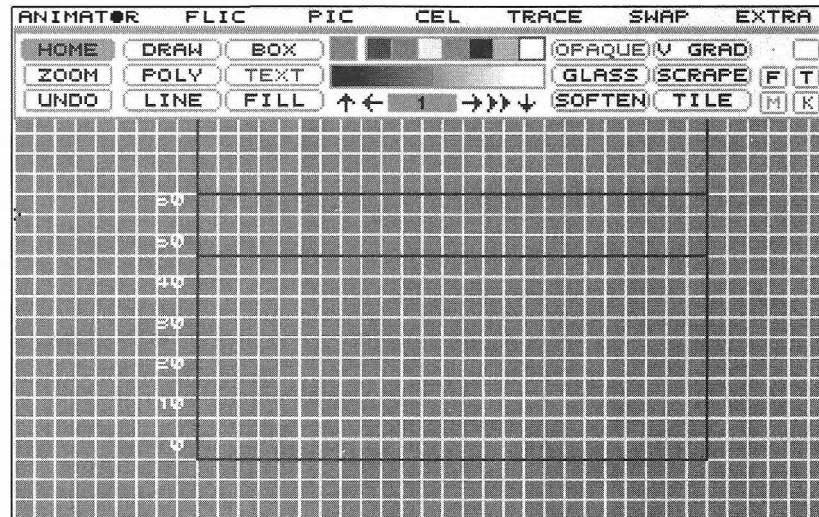
**Type 50 Press <enter> <enter>**

Continue to enter and leave a blank line after each of the following numbers: 40, 30, 20, 10.

**Press <spacebar>** Lines up cursor with the right column of numbers.

**Type 0** Zero.

**Right click screen** Pastes text.



*Numbers Pasted Beside Chart*

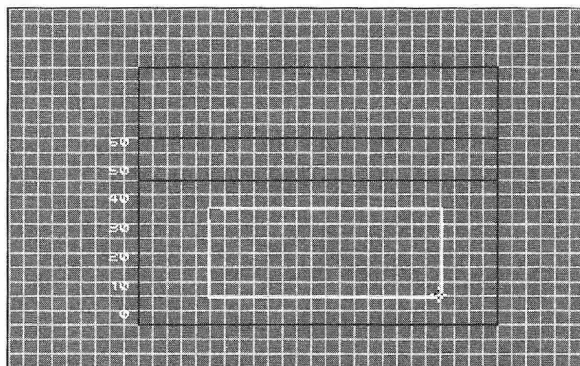
Although the corners of the editing box snap to the grid when it's in use, the spacing between characters and lines of the text are not affected by the grid. Our simple method of placing numbers worked out neatly because the eight pixel size of the default grid coincided with the vertical line spacing of the system font.

**TIP** *Animator fonts vary in size, in the spacing between characters, in the width of a space entered with the <spacebar>, and in the spacing between lines (leading). You cannot change these measurements (except by picking a different size font), but you can place the text first and then size your grid and lay out your chart to fit the text spacing.*

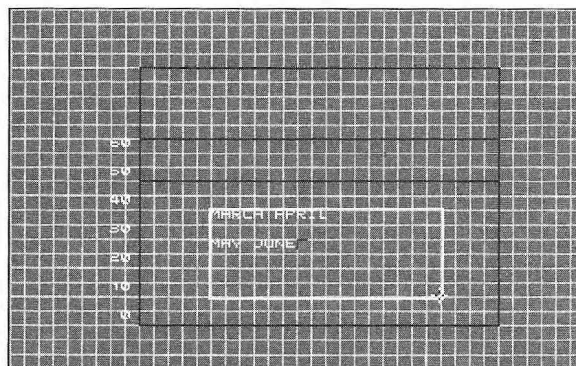
### *Entering Text for Labels*

You'll use the text tool to put titles, labels, legends, and other text on your charts, as well as numbers. The next exercise demonstrates a method for placing text on a chart regardless of the font size and spacing.

First you'll put a copy of the chart on the swap screen to use later. Then after entering text for the labels, you'll pick up a label as a cel and paste it on the clean copy of the chart. In setting the area for the editing box, make sure it doesn't overlap any dark red lines.



*Working Copy With Editing Box for Labels*



*Text for Labels*

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### **Entering Text for Labels**

Open **SWAP** Select **CLIP**

Use **TEXT**

Type **MARCH APRIL**

Press **<enter> <enter>**

Type **MAY JUNE**

Right click **screen**

Set two corners of an editing box 16 squares wide and 6 tall.

Creates text for two labels, separated by a space.

Enters text and leaves a blank line.

Creates text for two more labels, separated by a space.

Pastes text.

---

As you can see, the horizontal spacing of these characters does not match that of the default grid. We can adjust the text placement by using cels to move words.

### *Pasting Text as Cels*

Leaving a space between the lines of text makes it easier to pick up a label as a separate cel. In the next exercise, you'll collect the first label (MARCH) as a cel, position it on the clean copy of the chart, and then paste it on the chart.

Turn grid snap off to gain finer control over the label's placement. While the grid is in use, the edge of the cel — not the edge of the first character — snaps to the grid. Notice that the pasted lines of the grid remain on screen after you turn grid snap off.

---

### Labeling the Chart

Open **CEL Select GET**      Set two corners around "MARCH," excluding any dark red lines or other text.

Type **eg1 Press <spacebar>**      Turns grid snap off.

Open **SWAP Select TRADE**      Brings back original chart.

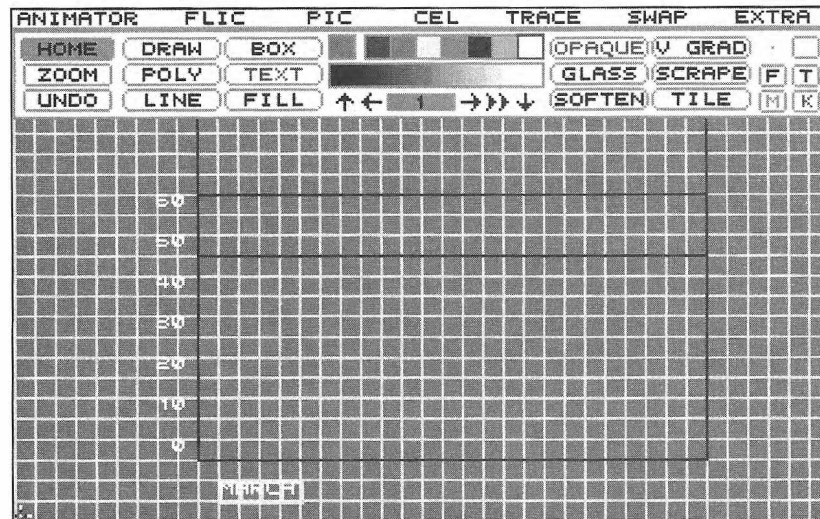
Open **CEL Select MOVE**      Displays cel with "MARCH" label.  
Click **screen**      Picks up cel for repositioning.

Reposition "M" one grid square below bottom and one grid square in from left of chart.

Click **screen**      Completes move.

Open **CEL Select PASTE**  
Right click **screen**      Pastes label in place.

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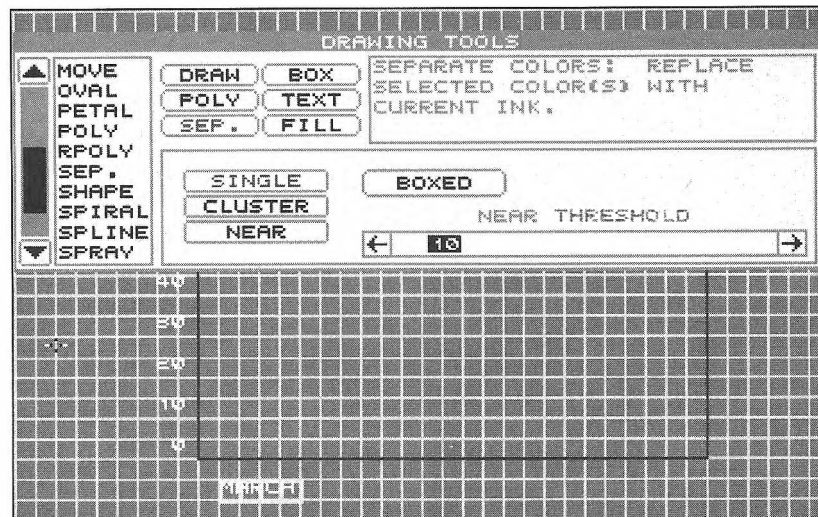
*MARCH Label Pasted on Chart*

You could put the other three labels on the chart the same way. However, a more efficient method would be to move and paste in one operation by selecting CEL PASTE, clicking once to move the cel, and clicking again to paste it into position.

As you get and paste cels from the swap screen to label the other months, you'll find that a part of the grid gets carried along too. Don't be concerned. You can use the separate tool to hide the grid by making it the same color as the background. You'll do that next.

## The Separate Tool

You'll use the separate tool often. It's a quick way to change particular colors that are on screen. By setting the separate tool's options on the drawing tools panel, you can replace a single color with another throughout the drawing, change all colors in the current cluster that appear in the drawing, limit replacements to a boxed area of the screen, or replace all colors near the value of a selected color (the threshold slider controls the range that will be replaced). If you select SEPARATE on the PIC menu when the [T] (time select) button is turned on, you can make the same kinds of changes to a sequence of frames.



*Separate Tool's Options*

The exercises in the following chapters rely often on the separate tool. For the next exercise, you'll use the single option, which is turned on by default, to remove the grid from the screen.

To make the separate tool available on the home panel, you'll put it in the slot now occupied by the line tool. Then you'll change the light green grid to the key color so it will no longer be visible.

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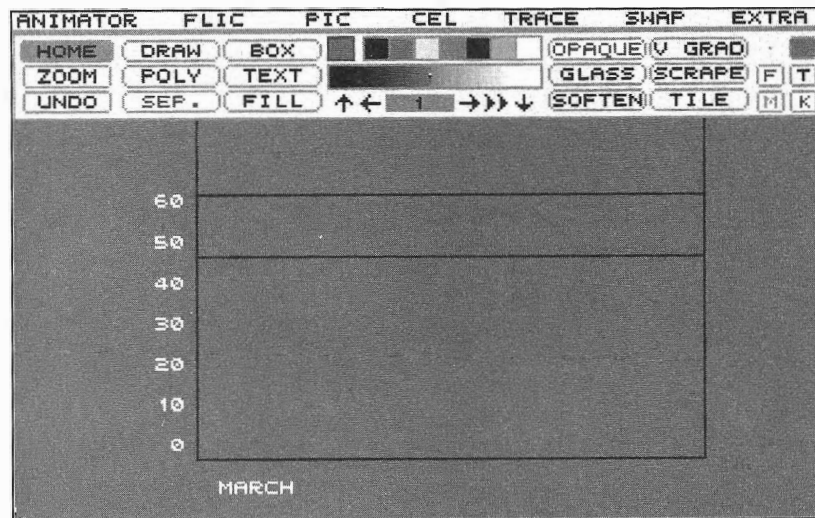
## Removing the Grid

<i>Right click LINE</i>	Displays drawing tools panel.
<i>Click SEP</i>	Scroll down tool selection window to find and select SEP.
<i>Make certain SINGLE is turned on, and then return to the home panel.</i>	
<i>Click key color</i>	Selects key color as current color.
<i>Click green grid on screen</i>	Selects and fills grid lines with key color.
<i>Type pfs Click [+]</i>	Saves chart again, as CHART02.GIF.

---

Because the separate tool changed the light green color to medium gray, the grid is now the same color as the background.

**TIP** *If you have difficulty clicking on the color you want to replace because it occurs on only a few pixels or is drawn with a narrow brush, zoom in on it first.*



Grid Removed From Chart

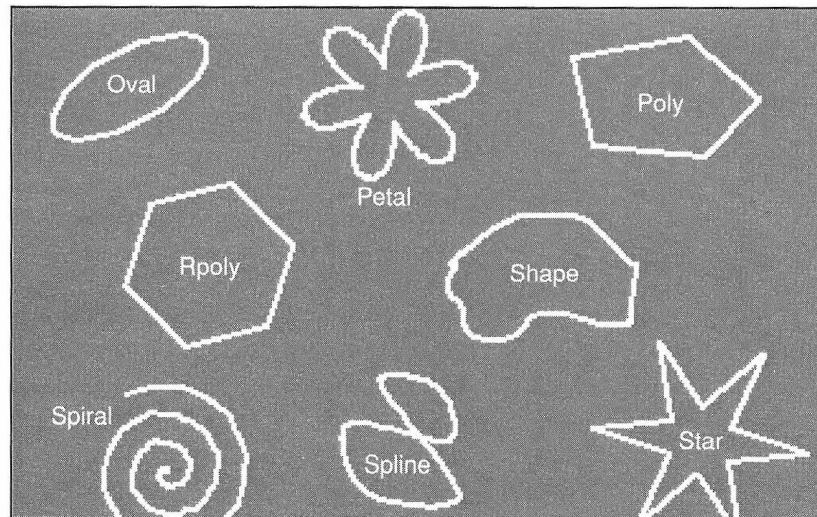
## The Tweening Tools

The *tweening tools* are used for *polymorphic tweening*. This is what professional animators call *metamorphosis* — gradually changing one shape into another over a sequence of frames. Like the text tool, the tweening tools will only be introduced here. They are covered more fully in Chapter 11.

There are eight tools that create *tweenable* shapes, called *polygons* in Animator:

- Oval — An oval, ranging from a perfect circle to a flat shape like a line.
- Petal — A flower shape with three to thirty-two petals.
- Poly — A connected series of line segments, open or closed.
- Rpoly — A regular polygon with three to thirty-two sides of equal length, such as a triangle or hexagon.

- **Shape** — A closed polygon with any number of sides in a freehand shape.
- **Spiral** — An open spiral.
- **Spline** — An open or closed series curved segments, with adjustable tension, continuity, and bias controlling its curvature.
- **Star** — Similar to the petal, with three to thirty-two pointy rays.

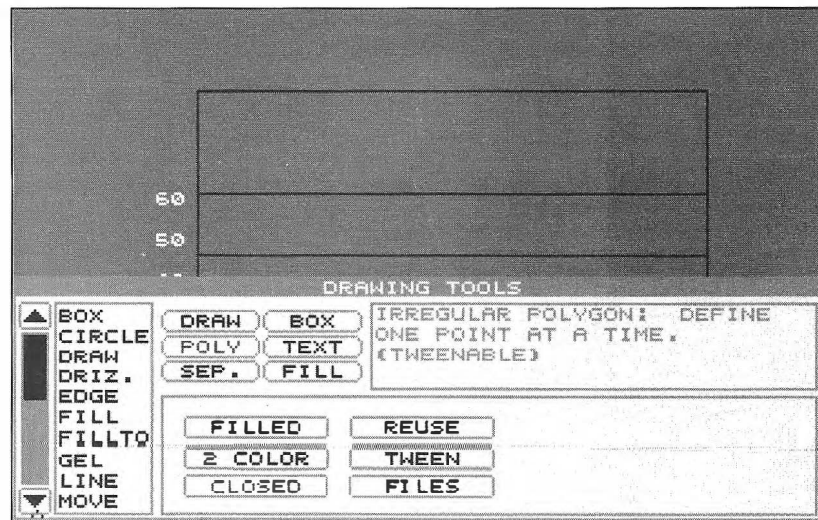


*Elements for Tweening*

Although all of these tools create tweenable shapes, you must select **TWEEN** from the options for the poly or spline tool to set up the actual tweening. You can then choose from the **TWEENING OPTIONS** submenu to create such metamorphoses as transforming petals into stars and kites into hummingbirds.

### ***Drawing a Column With the Poly Tool***

In order to arrive at a name-dropping acquaintance with the tweening tools, you'll create a simple metamorphosis. You'll use the poly tool to animate the increase in sales for March. The poly tool draws a series of straight line segments, ending each line segment when you click, until you right click to indicate the shape is completed. If **CLOSED** is turned on when you right click, the last point is automatically joined to the first point, making a closed polygon.



*Poly Tool Options on Drawing Tools Panel*

The easiest way to draw the column for March sales is to use the poly tool with the options for closed and filled polygons selected. It's not necessary, however, to go to the drawing tools panel in order to choose these options. Turning on the [F] button is the same as selecting FILLED. And since an open polygon cannot be filled, turning on the [F] button also turns on CLOSED, ensuring that the last line you draw is automatically joined to the first line, thereby closing the shape. You'll also find turning grid snap back on — but not pasting the grid again — makes it easier to line up the column in relation to the label and the numbers.

Place a rectangle above the March label. The bottom of the rectangle should be opposite the zero on the side of the chart, and the top should be opposite the number 30.

---

### Drawing a Column for the Chart



Continue from the previous exercise, or load IN03CHT2.GIF from the IN DISK.



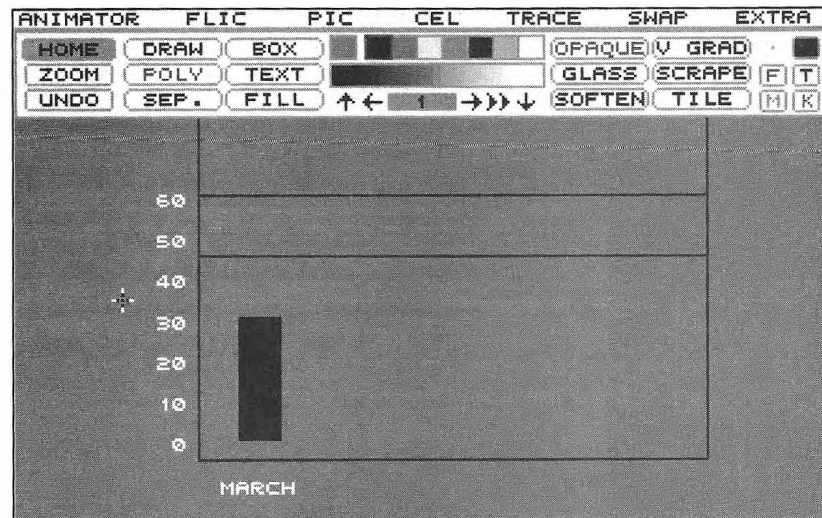
Continue from the previous exercise, or load CHART02.GIF from the previous exercise.



---

Click [F]	Turns FILLED on so shapes are closed and filled.
Click mini-palette	Select dark blue as current color.
Open EXTRA Select GRID	Check USE to turn grid snap on if it's off, then press <spacebar> to exit menu.
Click POLY Click screen	Move and click mouse to set each corner of rectangle.
Right click	Closes and fills rectangle.

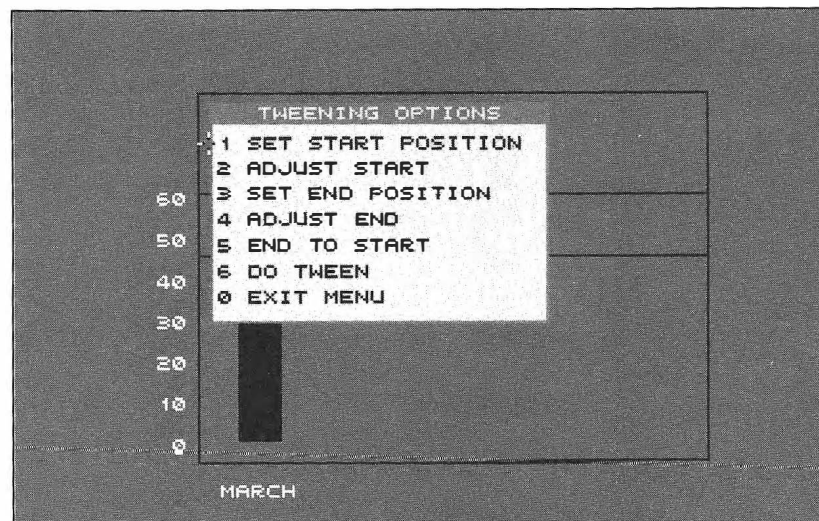
---



*Column Drawn on Chart*

### ***Setting Start and End Positions for Tweening***

Now you can set up the poly tool's TWEENING OPTIONS submenu. You'll set the column you drew as the starting position for the tweening. Then you'll adjust the shape for the final position by dragging diamond-shaped nodes that appear at each corner of the column. To drag a node, you click near it, move the cursor, and then click again to set it.



*Poly Tool's TWEENING OPTIONS Submenu*

---

### Setting Start and End Positions

*Right click* **POLY** *Click* **TWEEN**  
*Select* **SET START POSITION**

Displays **TWEENING OPTIONS** submenu.

Displays nodes on most recent tweenable polygon shape, the column.

*Right click* **screen**

Sets displayed polygon as start position.

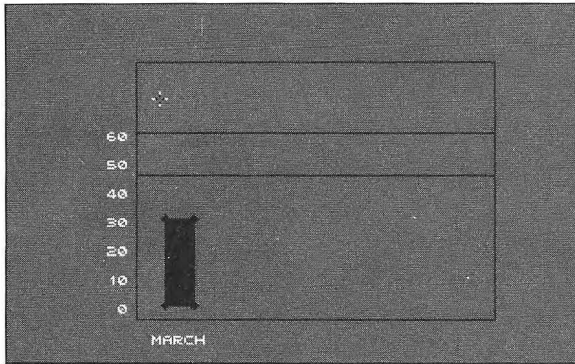
*Select* **SET END POSITION**  
*Drag* **nodes**

Displays most recently entered polygon, still the column.  
*Drag* upper-left, then upper-right nodes to position opposite number 50.

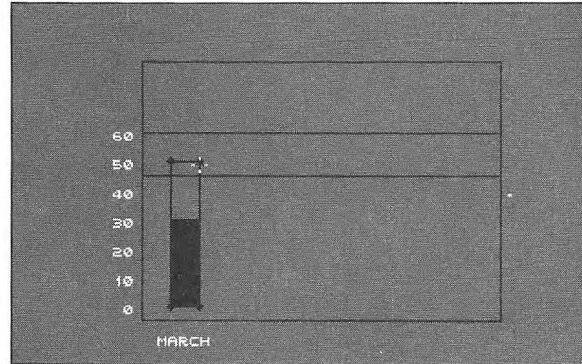
*Right click* **screen**

Sets adjusted shape of column as end position.

---



*Setting the Start Position*

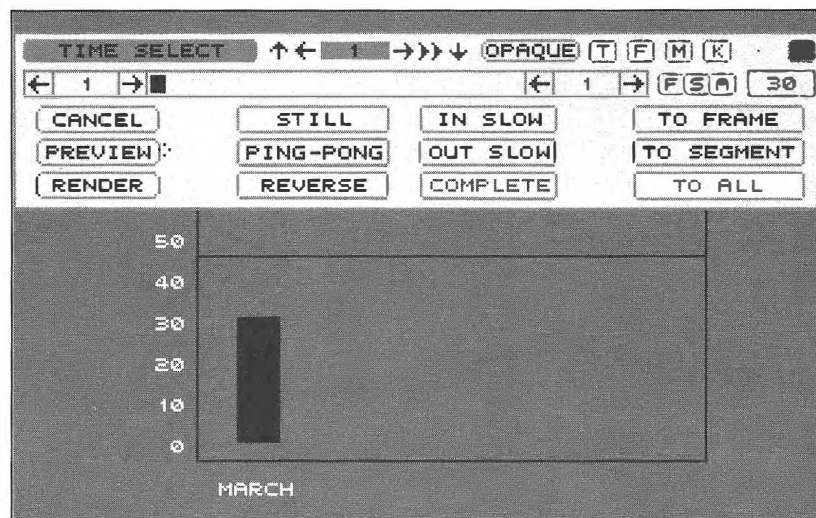


*Setting the End Position*

This metamorphosis uses the same polygon to set the start and end position. To use a second polygon for the end position, you would go back to the home panel after setting the start position and simply draw the second polygon, so that it becomes the most recent one. You can also select FILES from the poly tool's options and load a polygon file.

### ***Tweening the Column: An Animated Chart***

Next you can try out the tweening. In the following exercise, you'll set the number of frames, preview the animation, and render it. When the rendering is completed, you will be returned to the TWEENING OPTIONS submenu.



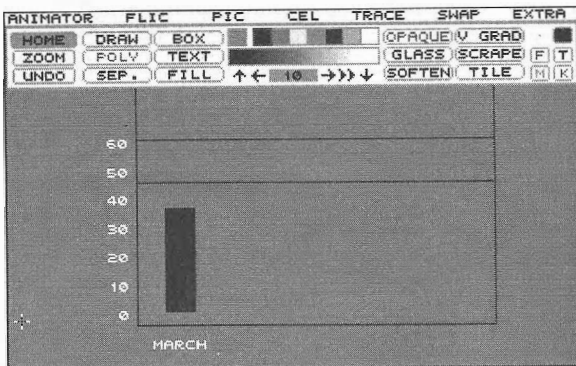
*Time Select Panel*

---

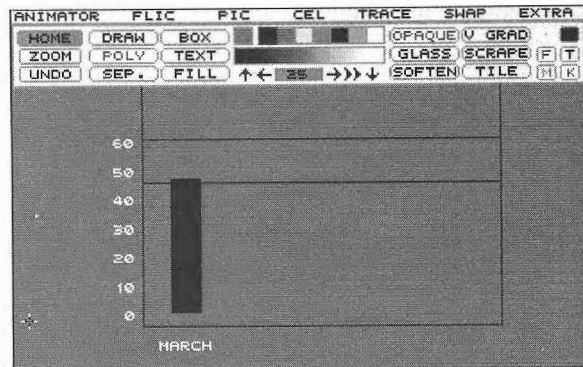
## Tweening the Column

<i>Select</i> <b>DO TWEEN</b>	Displays time select panel.
<i>Right click</i> <b>frame control icon</b>	Any frame control icon displays frames panel.
<i>Right click</i> <b>total frames box</b>	<i>Enter</i> 30 frames for flic.
<i>Right click</i> <b>screen</b>	Displays time select panel again.
<i>Click</i> <b>PREVIEW</b>	Plays animation through once.
<i>Right click</i> <b>screen</b>	Displays time select panel again.
<i>Click</i> <b>RENDER</b>	Creates the animation.
<i>Right click</i> screen until you return to the home panel.	
<i>Click</i> <b>frame control play icon</b>	Plays the flic.
<i>Press</i> <b>&lt;spacebar&gt;</b>	Pressing any key stops flic.

---



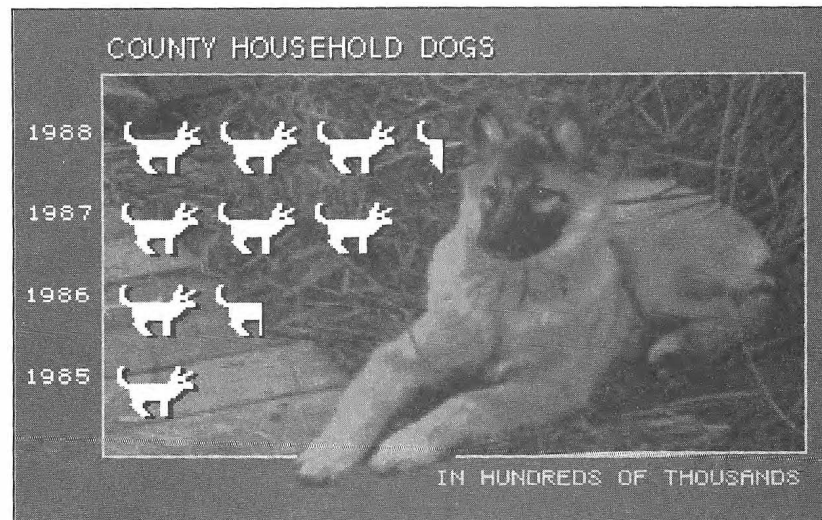
*Tweening the Column*



Save the flic if you'd like to go back later and animate the other three columns at your leisure. To do so, you would draw each polygon and tween it, starting on frame 1 of the flic. Or you could animate the columns sequentially by adding segments. This technique is described in Chapter 7.

### ***Creating Other Visual Effects***

In addition to animation, there are other techniques for making your charts visually effective. Scan in an appropriate photograph for background. For example, a rainfall chart could have a scanned photograph of a dramatic storm hitting the seashore as a background.



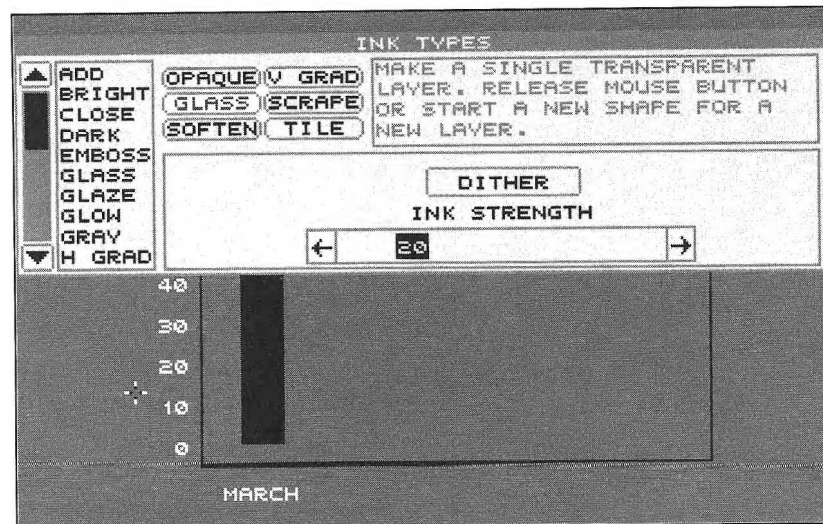
*A Chart With Scanned Photograph for Background and Icons*

Another visually intriguing technique is to use icons to represent units of measurement. Pineapples instead of columns can show an increase in agricultural production; piles of coins can represent sales.

## The Ink Types Panel

Like the tools you keep handy on the home panel, you can keep six inks ready for use. To change the setting of an ink's option or to replace one ink with another, right click on any ink to display the ink types panel. To save the arrangement of inks on the home panel, you can save a settings (SET) or DEFAULT.FLX file.

The ink types panel is similar to the drawing tools panel. The ink selection window is on the left, the six current inks on the home panel are in the six slots, a short description of the selected tool is on the right, and options for the selected tool are in the bottom portion of the panel.



*Ink Types Panel, Glass Ink Selected*

Some of the 26 inks are not what many people would imagine an ink to be. Opaque ink probably comes closest to meeting a conventional definition of an ink. Bright ink, dark ink, and gray ink act like color adjusters that let you make direct on-screen adjustments to colors you would otherwise have to adjust on the palette panel. And scrape ink is more like a paint remover than an ink.

Many inks are really shortcuts to powerful optical effects. Jumble ink, for example, produces a random mixture of pixels on the screen. Spark ink performs calculations on the colors of adjacent pixels to produce unusual changes. Split ink moves alternating rows of pixels in opposite directions. The gradient inks also fall into this category. These effects can be used to create textures that look like marble or to paint a dawn sky. They seem best suited for covering abstract areas, rather than for filling in representational shapes. You can use these effects to distract attention from Animator's low resolution.

Some pairs of inks are so similar that at first you may have trouble distinguishing them. Glass ink and glaze ink do the same thing; each makes the current color transparent when applied over other colors. You can use them to create the illusion of a window you can see through. Glass ink becomes less transparent with each separate repeated application, as does glaze ink. But glaze ink also becomes less transparent the longer you hold down the mouse button on each

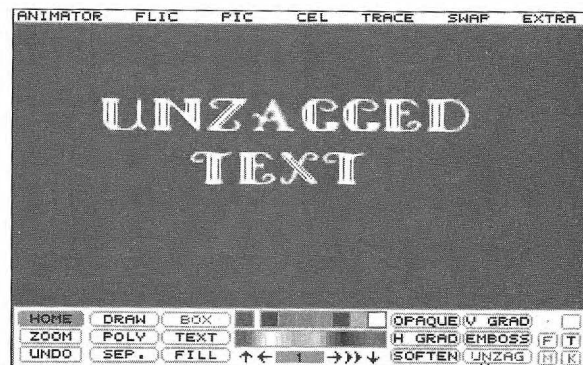
application. The decision to use one of these over the other is largely a matter of the style of execution you prefer. Would you rather make adjustments by repeating the action or by holding down the mouse button? After you are experienced with the effects of both inks, you'll have a sense of how many applications are needed or just how long to hold down the button in order to create the look you want.

Soften ink and unzag ink both ameliorate the *jaggies*, that is, the staircase result on curves that is due to the program's low resolution. The jaggies are the zig-zag effect observable on text characters, curves, and diagonals, especially if you zoom in on them. Soften blurs them, but also blurs straight edges. Unzag works only to blur the jaggies; it's an *anti-aliasing* ink.

**TIP** *Unzag is usually preferable to soften ink for smoothing the curves in text, because unzag ink leaves characters more legible.*



Soften Ink on Text



Unzag Ink on Text

Many inks are better experienced than described. It's cumbersome to explain that under certain conditions, emboss ink puts a highlight at the upper-left edge of a shape while it shadows the lower-right edge. And it is certainly less illuminating to talk about the differences between horizontal gradient ink and linear contour gradient ink than to compare the two inks on screen. Jumble ink, hollow ink, tile ink, and others — once you've tried them, they become self-explanatory.

### Changing Options

There are two options you can set for most inks: DITHER and INK STRENGTH. Generally, dithering blurs the borders of adjoining colors,



although its results vary with different inks. The ink strength can be set from zero to 100. A number of inks, such as opaque ink, have no options. The gradient inks have only the dithering option. Glass ink and emboss ink have options for both dithering and ink strength.

Unlike the tool options, setting an option for one ink does not set it for all. For example, DITHER is turned on by default for all the gradient inks. However, if you turn off dithering for v grad ink, it remains on for the others. By the same token, setting the ink strength for glass ink to 20 does not change the ink strength setting for emboss ink.

To turn an ink's dithering on and off, highlight the ink on the ink types panel and click on the option. To change ink strength for a particular ink, move the slider. In the next exercise, you'll change the ink strength setting for glass ink. The default setting is 50.

---

### Changing an Option

*Right click GLASS*  
*Drag ink strength slider*

Displays ink types panel and highlights glass ink.  
Set glass ink to a strength of 20.

---

When you select other inks, you'll see that their options are unaffected by the change you just made to glass ink.

### *Replacing Inks*

The remaining exercises in this chapter introduce emboss ink and three of the gradient inks. You'll start by putting them on the home panel so you won't have to go back and forth to the ink types panel later. After you select emboss ink, you'll increase the ink strength to dramatize its effect. Glass ink should still be highlighted.

---

### Replacing Inks

*Click ink selection window*

*Find and select h grad ink to replace glass ink.*

*Click SOFTEN*

*Highlights soften ink.*

*Click ink selection window*

*Select r grad ink to replace soften ink.*

Replace scrape ink with emboss ink.

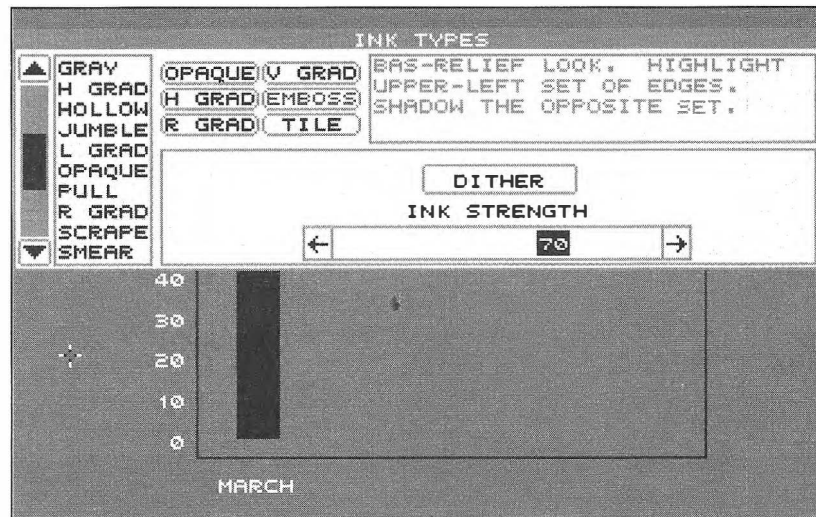
Drag ink strength slider

Set emboss ink to a strength of 70.

Right click screen

Returns you to home panel.

---



*Three Inks Replaced on Drawing Tools Panel*

## Emboss Ink

Emboss ink produces an illusion of depth, as if the surface of a shape is slightly raised from the background. Results can range from a subtle drop shadow to dramatic surface texturing.

Emboss ink can be used with any tool. If you apply emboss ink with the fill tool, the shape you select will be embossed. If you combine it with the poly tool, the portion of the screen within the polygon will be embossed, provided the filled option is on.

To see the effect of embossing on a variety of shapes and colors, you'll apply it to the chart. Since you'll also try out other inks on the chart, put a copy on the swap screen for safekeeping. Emboss ink should already be selected on the home panel. Selecting **APPLY INK** embosses the entire screen at once.

---

## Trying Emboss Ink

Open **SWAP** Select **CLIP**  
 Open **PIC** Select **APPLY INK**

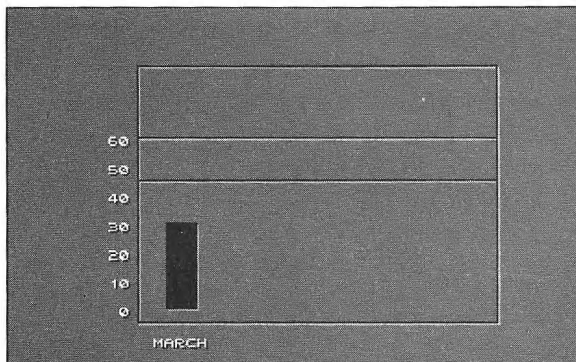
Copies chart to swap screen.  
 Embosses all images on screen.

Click **FILL**  
 Click **screen**

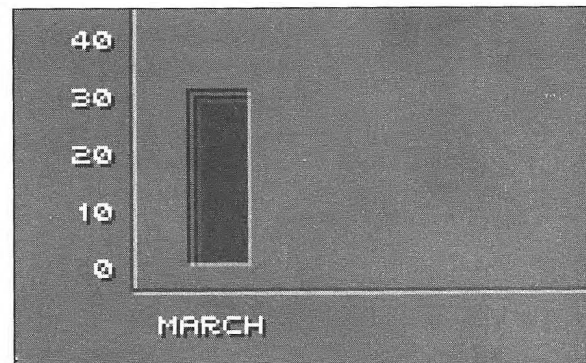
Highlights fill tool.  
 Click inside dark blue column three times.

---

Notice that the current color does not affect the embossing — embossing selects appropriate colors from the full palette. The shadowing effect is most noticeable on the white text.



Embossing the Chart



**TIP** Sometimes the colors selected by emboss ink aren't what you want. Use the separate tool to replace them with desired shades.

Emboss ink is one of the inks that extends its effect over repeated applications. Other inks you should try out include bright ink, dark ink, gray ink — and for particularly unusual effects over multiple applications — spark ink.

**MORE** Try emboss ink with the tools that create filled shapes: the circle tool, the star tool, and so on. Combining jumble ink and emboss ink over a full screen of v grad ink produces interesting textures. Depending on the strength of each ink, multiple applications may result in a texture resembling worsted wool, cement, a gravel pit, or the surface of the moon.

## The Gradient Inks

The four gradient inks use all the colors in the cluster on the home panel instead of the current color:

- V GRAD stacks the cluster colors in order vertically, placing the left-most cluster color on top.
- H GRAD arranges the cluster colors horizontally in the order they appear in the cluster.
- L GRAD arranges the cluster colors in the same order as H GRAD and contours the outermost colors when applied to curved shapes.
- R GRAD arranges the cluster colors in concentric circles, with the left-most cluster color at the center.

The next exercise demonstrates the effects of h grad and v grad ink on the rainbow cluster. If you've been working straight through this chapter, the gray-scale cluster should still be on the home panel.

---

## Trying Gradient Inks

Open **SWAP** Select **PASTE**  
Right click **cluster**  
Click **[B]**

Brings back chart as it was before embossing.  
Displays palette panel.  
Selects colorful rainbow cluster.

Return to home panel.

Click **H GRAD**  
Use **FILL**

Highlights horizontal gradient ink.  
Click inside dark blue column.

Open **SWAP** Select **PASTE**  
Right click **V GRAD** Click **DITHER**

Pastes swap screen again.  
Turns off dithering for vertical gradient ink.

Return to home panel.

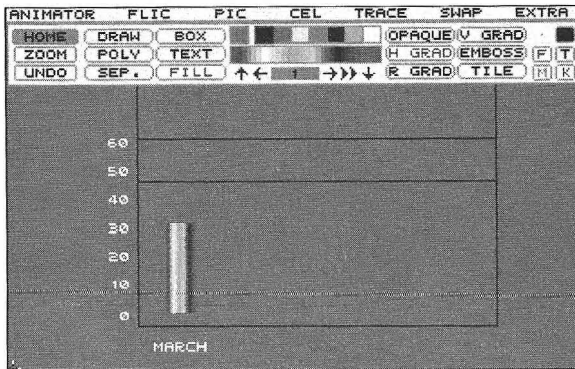
Use **FILL**

Click inside dark blue column to fill it with vertical gradient ink.

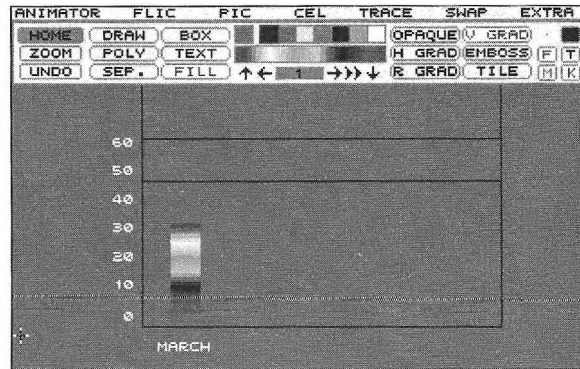
---

As you can see, the entire range of colors in the cluster is contained within the shape of the column, horizontally when h grad ink is used, vertically when v grad ink is used. When dithering is on, as it was for

h grad ink, the borders between adjoining colors are blurred. With dithering turned off for v grad ink, distinct borders show between adjoining colors.



*Dithered H Grad Ink in Column*



*V Grad Ink in Column, Dithering Off*

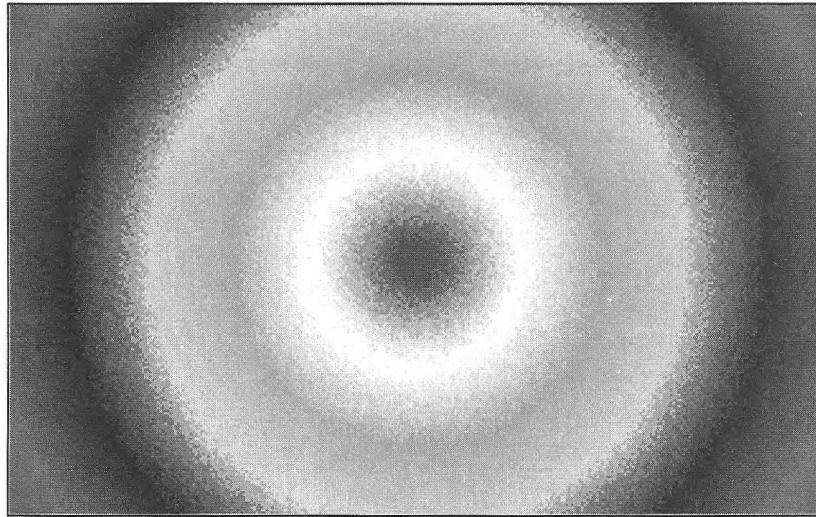
Line-contour gradient ink and radial gradient ink have unique properties that help create the illusion of depth or volume when applied to circular images. You'll explore them further in Chapter 4.

To quickly see what the radial gradient ink does in its simplest application, try this:

## Trying R Grad Ink

Type <b>x</b>	Clears screen.
Click <b>R GRAD</b>	Highlights radial gradient ink.
Right click	Displays entire screen.
Type <b>pa</b>	Applies ink to entire screen.

Instant psychedelic art!

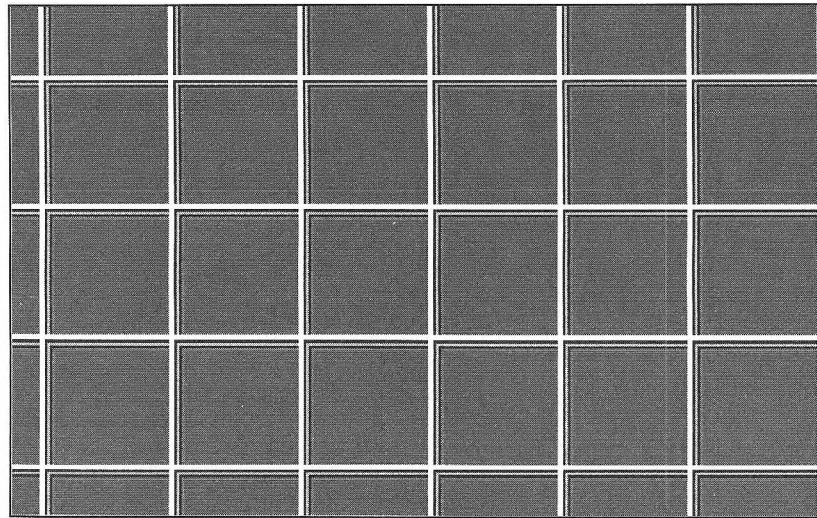


*R Grad Ink Applied to Entire Screen*

**TIP** *Keeping the home panel on screen is a good idea while you're learning Animator. However, after you're comfortable with common keyboard alternatives, such as PA for Open PIC Select **APPLY INK**, you'll probably find it simpler to work on the entire screen. Right click or press the spacebar when you need to see the home panel or menu bar.*

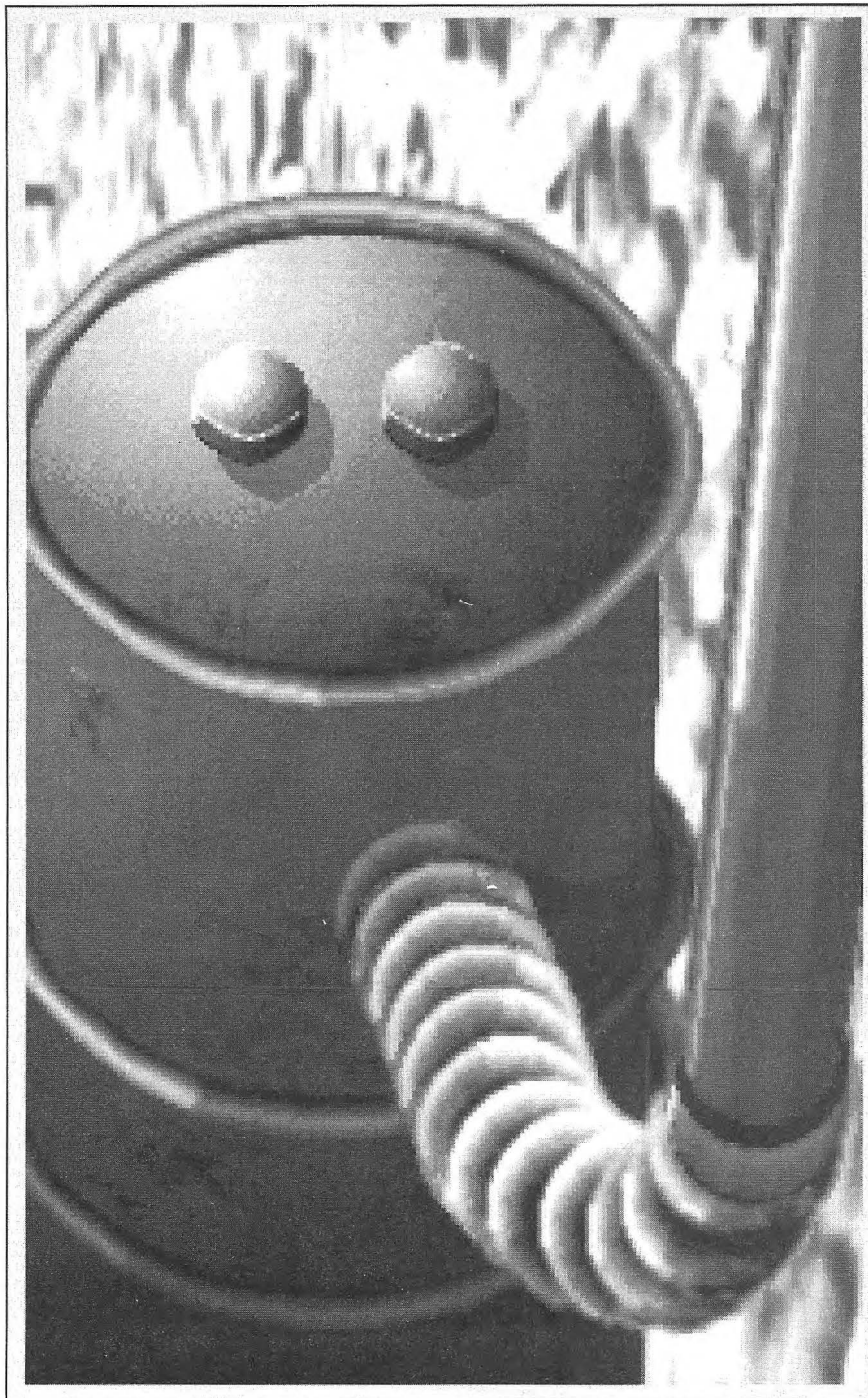
## Next Steps

This chapter has taken you part of the way toward full appreciation of Animator's tools and inks. Take time to experiment with some of the interesting inks on the ink types panel. Try using tile ink, for example, to create repeating patterns like a tiled floor, shingles on a roof, or a wallpaper design. To tile, you create a shape and make a cel of it. Then, when you apply the ink, the cel is reproduced as many times as it fits in the area to which it is applied.



*A Tiled Surface*

You can also do much more with the text tool, as you'll discover in Chapters 6 and 9. Additional tweening techniques are presented in Chapter 11. And the next chapter explains, among other topics, how to devise new gradients for the gradient inks.



*Shades, Gradients, Textures, Shadows*



# Nearly Innumerable Colors

Color, glorious color. Ranges to revel in, hues to lose yourself in. For those of you who always wanted the biggest box of crayons in the store, you have it now in digital form — 262,144 colors to choose from, and as many as 256 different colors for each picture.

Some may mutter, “That’s still not enough.” Cycling colors, making a gradient for the background, blending colors for anti-aliasing, and matching flesh tones are just a few animation techniques that can use up a bunch of colors quickly.

Whether you consider 256 colors per picture a bonanza or scant rations will probably depend on what you are trying to accomplish. For complex movements requiring a large amount of *compositing* (merging multiple elements into one flic), you’ll most likely need to plan ahead to stay within 256 colors. However, the ease with which you can adjust colors to take advantage of the hundreds of thousands of possibilities is truly remarkable, especially if you’ve been limited to sixteen colors or a monochrome system.

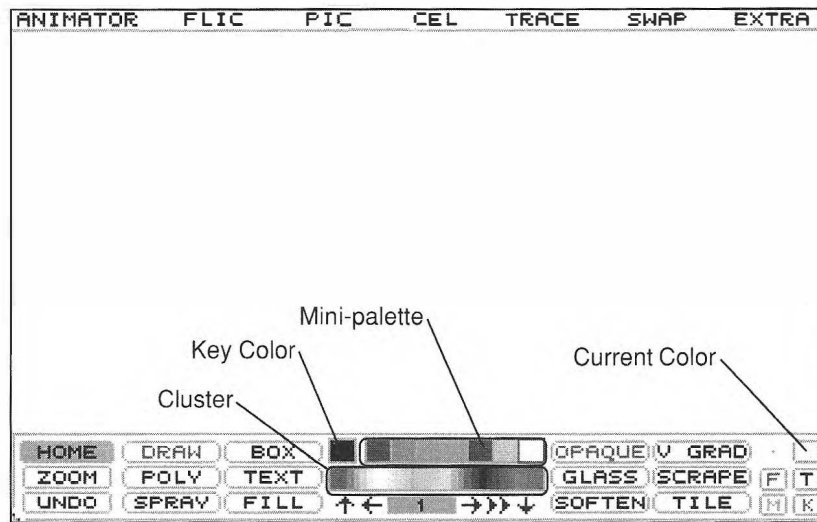
This chapter covers selecting, changing, and arranging colors, singly and in groups. The exercises illustrate how to set up a palette, combine and consolidate palettes, copy colors, and apply tints. Color cycling is introduced here, but it is given full attention in Chapter 10. Transferring colors to videotape is discussed in the appendixes.

## Colors on the Home Panel

Like the tools and inks you use most often for a project, you can set up the colors you want to have handy while painting. The four locations on the home panel where you can keep colors are:

- The *current color* slot, which is at the upper far right of the home panel.

- The seven *mini-palette* slots, at the top of the home panel just to the left of the inks.
- The *key color* slot, immediately to the left of the mini-palette.
- The *cluster box*, which is below the key color slot and the mini-palette slots.



*Colors on the Home Panel*

Different colors may be placed in each of these locations. The current color need not be one of the colors in the mini-palette, for example. The key color may be the current color. The cluster box may contain many shades of one color or any group of colors you've chosen.

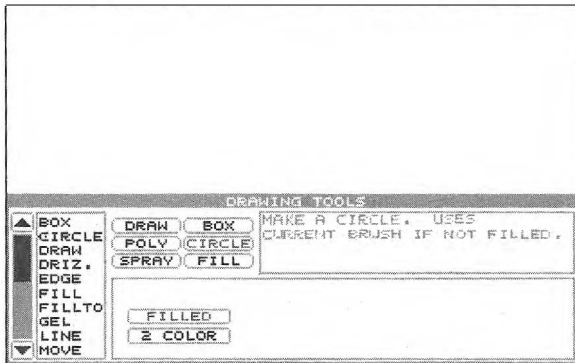
A color's location determines its use. The current color is used by most inks (those that apply one color, such as opaque ink). Some inks are affected by the current color without applying it directly. For example, glass ink uses any number of colors derived by translucently shading existing colors with the current color. The gradient inks use all of the colors in the cluster box. The separate tool uses the current color or the cluster colors, according to the option you've set.

## Changing the Current Color

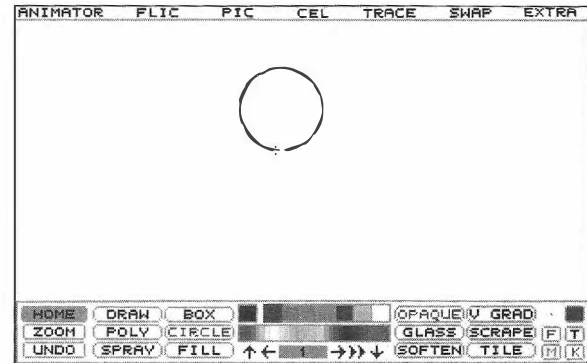
On the home panel, you can easily select any color in the mini-palette, any of the cluster colors, or the key color as the current color. To

change the current color, click on the replacement slot or on the color in the cluster box.

In the following exercise, you'll use the circle tool to draw three balloons, each a different color. Notice that when you select a color from the mini-palette or the key color, the slot is outlined in red. When you select a color from the cluster box, a black dot and a white dot mark the color.



*Circle Selected on Drawing Tools Panel*



*Setting Radius of Circle*

## Replacing the Current Color on the Home Panel

### Type fry

- |                                         |                                             |
|-----------------------------------------|---------------------------------------------|
| Click <b>mini-palette</b>               | Select white as current color.              |
| Open <b>PIC</b> Select <b>APPLY INK</b> | Covers entire screen with white opaque ink. |
| Right click <b>TEXT</b>                 | Displays drawing tools panel.               |
| Click tool window                       | Select circle tool to replace text tool.    |

Return to home panel.

- |                                 |                                                                                |
|---------------------------------|--------------------------------------------------------------------------------|
| Click <b>mini-palette</b>       | Select dark blue as current color.                                             |
| Click <b>screen</b>             | Set center of circle for first balloon in upper middle of screen.              |
| Move cursor Click <b>screen</b> | Move cursor until circle is size illustrated, then click to set.               |
| Click <b>mini-palette</b>       | Select orange as current color.                                                |
| Use <b>CIRCLE</b>               | Draw similar size orange circle, overlapping lower right edge of first circle. |

*Click cluster*

*Use CIRCLE*

*Select a yellow color as current color.*

*Draw smaller yellow circle at lower left edge of dark blue one.*

*Click key color*

*Click DRAW*

*Selects black key color as current color.*

*Draw a string from each balloon, as shown below.*

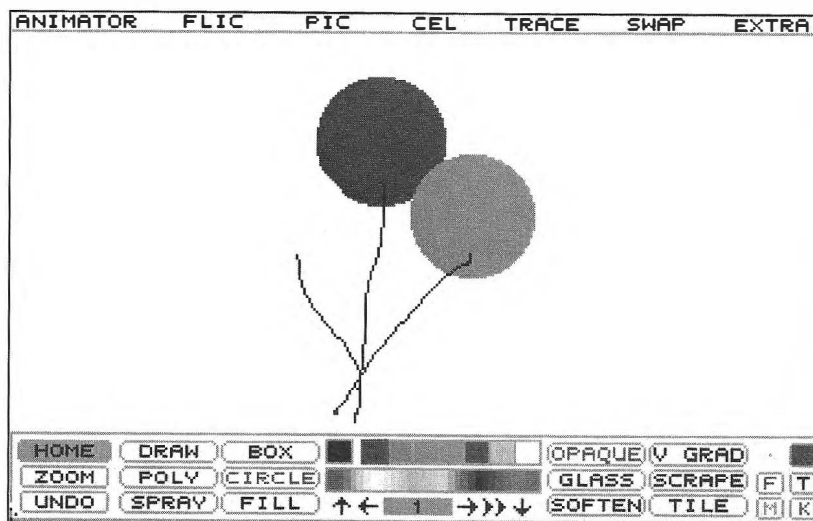


You already have this picture as IN04BALN.GIF, from the IN DISK.



Save this picture as BALLOONS.GIF, to be used again later.

---



*Three Balloons*

Once a picture is in progress, it's often easier to select the current color from the screen instead of selecting it from the mini-palette or cluster box. To make any color on screen the current color, position the cursor over the color and press the <F1> key.

This method is especially useful when the cluster box contains several similar shades. For example, to select the yellow color of the third balloon again, you can take it from the screen, rather than looking for it again in the cluster box:

---

## Changing the Current Color to a Color On Screen

**Move cursor** Press <f1>      *Position* cursor on yellow balloon and pick it up as current color.

**Click CIRCLE**      *Click* in center of yellow circle and redraw it a bit larger.

---

As a reminder, the current color slot also appears on the palette panel, optics panel, and time select panel. However, you can replace the current color only on the home panel and on the palette panel. On the palette panel, the method is even simpler than on the home panel: click on any other color, on the panel or on the screen, and it becomes the current color.

**TIP** *If you get unexpected results on screen after drawing an object, it's a good idea to check the settings and toggles on the home panel. For example, after drawing a circle, you may be surprised to find nothing appears on screen. A common mistake is to forget to change the current color back to a color that shows up against the background. At other times, you may forget to change back to opaque ink after using an ink such as soften, which doesn't apply a color directly. Similarly, the result may not be what you expect if the [F] button is turned on or off.*

## Changing Key Color and Mini-Palette Colors

Once you're in the midst of painting, you may want to change the key color or the colors in the mini-palette. To change any of these colors, right click on the slot and then click on the replacement, which may be any color on the home panel or screen. After changing the color of the background, for example, you should make that color the key color if you are going to do any pasting or other cel operations. The reasons for this are discussed at length in Chapter 5 in the section on key color and the cel.

The next exercise illustrates several ways to change the key color. Notice that after you right click on the key color slot, the current color slot reflects the color under the cursor to guide your selection but is unchanged after you make your selection.

---

## Changing the Key Color

<i>Right click key color</i>	Selects key color slot to be changed, outlining it in red.
<i>Click mini-palette</i>	Select white as new key color.
<i>Right click key color</i>	
<i>Click frame control icon</i>	Click on any frame control icon to change key color back to black.
<i>Right click key color</i>	
<i>Click screen</i>	Click cursor on any white area of screen to change key color back to white.

---

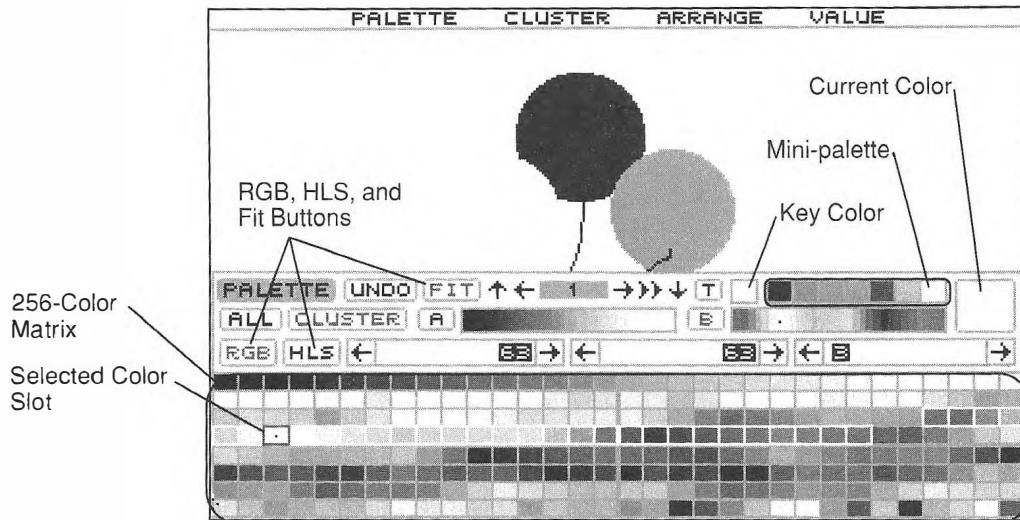
You can also use these methods to change any color in the mini-palette slots.

**NOTE:** *Changes to settings, such as key color, cannot be reversed by UNDO, which undoes only changes to the screen image.*

The colors in the cluster cannot be replaced from the home panel. But right clicking on the cluster box displays the palette panel, where you can change or rearrange the cluster. Right clicking on the current color slot also displays the palette panel.

## Selecting Colors on the Palette Panel

So far, you've begun a picture using only the default colors on the home panel. In your own work, you'll want to set up the mini-palette, the key color, and the clusters of colors needed for each project. You can replace colors on the home panel with other colors selected from the *color matrix* on the palette panel.



*Palette Panel*

The 256 slots of the color matrix, divided into eight rows of 32 slots each, take up most of the palette panel. The key color slot, mini-palette slots, and a much-enlarged current color slot are grouped together on the upper right of the palette panel. An A cluster and a B cluster appear above the color matrix. At the top of the screen, a set of new menus appears on the menu bar.

The slot in the color matrix that contains the current color is outlined in red. You can change the current color by clicking on any color on the palette panel or on the screen. Changing the colors in the mini-palette slots and the key color slot is the same as on the home panel: right click on the color to be changed and then click on the replacement.

### ***Redefining Clusters***

The slots in the color matrix that contain the current cluster (the one whose button is highlighted) are outlined in light gray. To change the colors in the current cluster, select GET CLUSTER on the palette screen's CLUSTER menu and then define the new range by clicking on two colors in the color matrix. The first becomes the left-most cluster color, the second becomes the right-most cluster color, and the intervening colors fill the range. An alternative is to right click on either cluster box and then select two colors to define the new range.

This latter method works on either cluster, whether or not selected as the current cluster. As usual, you can right click to cancel.

After defining a new range, it is possible to replace the color in any matrix slot within a range with a color from any other matrix slot, and have the new cluster reflect the change. To do so, you would right click on the matrix slot you want to change and then click on its replacement.

The CLUSTER menu provides other methods for defining clusters, including LINE CLUSTER, which puts into the cluster all the colors beneath a line you draw on screen; UNUSED COLORS, which puts into the cluster all the colors in the color matrix you haven't used on screen; and REVERSE, which makes the last cluster color the first, the next-to-last color the second, and so on, reordering the other colors from right to left.

### ***Changing Mini-Palette and Cluster Colors***

In the following exercise, you'll display the palette panel and select colors from the color matrix to bring back to the home panel. Watch the status line and the current color slot while you do the exercise. They provide information about each color the cursor moves over.

---

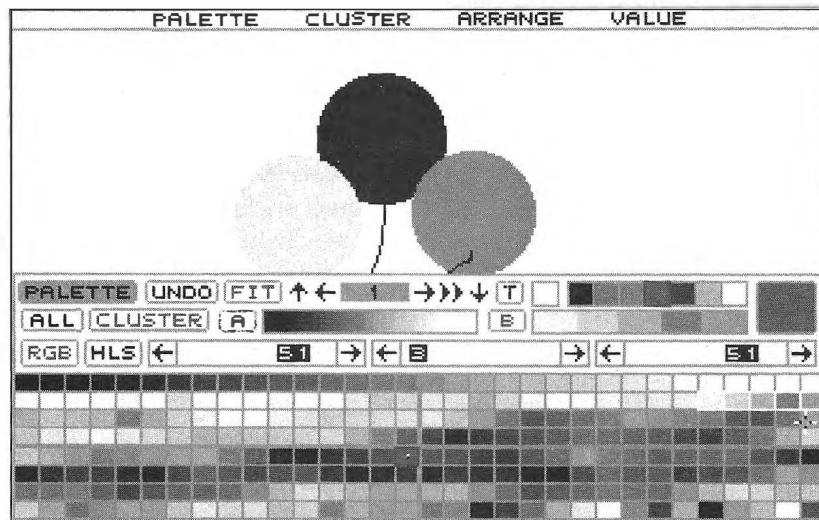
### **Changing Colors on the Palette Panel**

<i>Right click cluster</i>	Displays palette panel and menu bar.
<i>Right click mini-palette</i>	Select orange to be replaced.
<i>Click color matrix</i>	Select purple in fifth row of color matrix, sixteen slots from left.
<i>Right click cluster box</i>	Select B cluster colors to be replaced.
<i>Click color matrix</i>	Select light blue, fifth matrix slot from right in second row, as starting color.
<i>Click color matrix</i>	Select right-most color matrix slot in second row as last color in new range. Notice the new color range in the B cluster, and the corresponding color matrix slots outlined in gray.

Return to home panel.

---





*New Cluster Outlined in Color Matrix*

### ***Changing Screen Colors***

On the home panel, the purple color has replaced the orange color in the mini-palette and the new range of colors is in the B cluster box. Now you can use these colors on the screen.

In the next exercise, you'll use the fill tool to change the color of the orange balloon to purple. You'll use the separate tool and v grad ink to change the white background to the new range of colors in the cluster.

---

### **Changing Screen Colors**

Open **SWAP** Select **CLIP**

Copies picture to swap screen.

Click **mini-palette**

Select purple as current color.

Click **FILL**

Click **screen**

Click inside orange balloon.

Right-click **SPRAY**

Displays drawing tools panel.

Click **tool window**

Find and select **SEP** (separate) to replace the spray tool.

Return to home panel.

Click **V GRAD**

Click **screen**

Click on white background to fill with v grad ink.

---

As this exercise illustrates, the colors in a cluster need not be arranged in a continuous *gradient ramp*, i.e., in a series of colors that shift smoothly from the first tone to the last. The gradient inks apply the colors in the selected cluster, whatever their arrangement. However, if dithering is turned on, the colors are blended on screen where their edges meet. With so few colors covering a large area, you can see the dithering clearly on your screen.

**TIP** *The larger the number of colors in a gradient, the smoother the resulting effect of dithering. Computer graphics artists often resort to gradients to camouflage low resolution.*

The changes you've made to the colors on screen were the result of substituting colors from the 256 colors of the default palette. But you aren't limited to the original 256 colors. To use a color not included in the default palette, you can replace any of the 256 slots of the color matrix with a new color. The remaining exercises in this chapter demonstrate the various methods by which you can bring new colors — from the 262,144 possible — into the color matrix.

**TIP** *Before applying one of the gradient inks to the background, copy the picture to the swap screen if you think you might want the original background back again later. Gradient ink produces a multi-colored effect which cannot be replaced by using either the fill tool or the separate tool.*

## Adjusting RGB and HLS

As far as Animator is concerned, a color is a three-part number that specifies a precise mixture of the red, green, and blue components of light — hence the ubiquitous term *RGB*. The value of each red, green, and blue component can vary from zero to 63, yielding 262,144 (64 x 64 x 64) color values. The values for 256 colors are stored in 256 slots in memory, known as *registers*. The 256 slots on the palette panel graphically represent the colors that are currently stored in the color registers, numbered from zero in the upper left to 255 at lower right.

**NOTE** *Programmers begin a numerical series with zero. Thus, the 256 color registers are numbered from zero to 255, and the first slot in the color matrix represents color register zero. Following the same convention, the 64 levels of red, green, and blue light are numbered from zero to 63. The latter results in the RGB value of 0,0,0 for black (the total absence of light).*

As you might suspect, the color red consists of all red light, and no green or blue light. Accordingly, the RGB value stored in a register for the color red is 63,0,0. The color green is expressed as the RGB value 0,63,0, and the RGB value for the color blue is 0,0,63. When no red, green, or blue light is on, the color is black and the RGB value is 0,0,0. At the other extreme, all three lights turned up as high as possible produce white; its RGB value is 63,63,63. The intermediate colors — yellow, magenta, and cyan — are the mixture of the highest levels of red and green, red and blue, and green and blue, respectively.

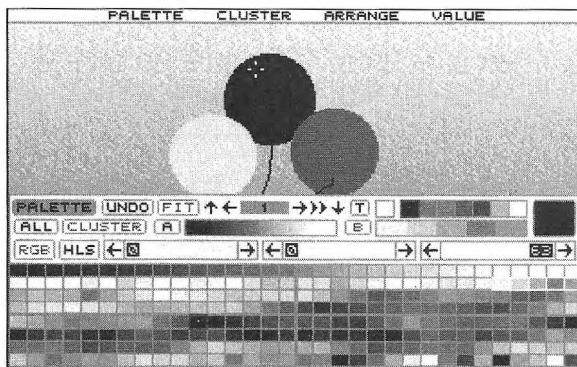
Color	RGB Value	HLS Value
Black	0,0,0	0,0,0
Red	63,0,0	0,126,255
Green	0,63,0	85,126,255
Blue	0,0,63	170,126,255
Yellow	63,63,0	42,126,255
Magenta	63,0,63	214,126,255
Cyan	0,63,63	128,126,255
White	63,63,63	0,252,0

#### *RGB and HLS Values for Basic Colors*

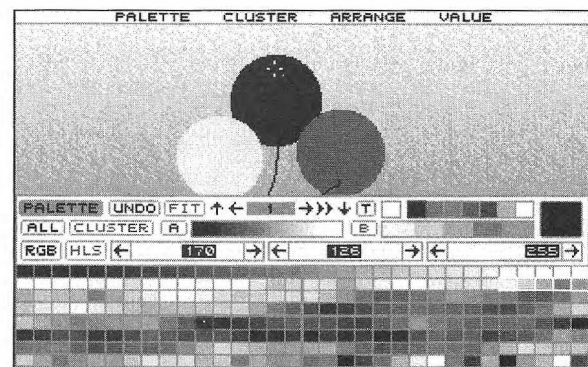
The three slider bars on the palette panel let you change a selected color interactively. When the RGB button is highlighted, you add more or take away some of the red, green, or blue light until the color you see is the one you want. The slider on the left adjusts the level of red light, the middle slider adjusts green light, and the right slider adjusts blue light. To set the number in each slider bar to the value you want, either drag the number, click in the slider, or click on the arrows.

When the HLS button is highlighted, you can adjust hue, luminance, or saturation from zero to 255 until the color suits you. Artists may be more familiar with this color system. The left slider sets *hue* (color), the middle slider sets *luminance* (brightness), and the right slider sets *saturation* (purity — zero is very gray, 255 is pure color).

**NOTE** *The three HLS sliders adjust from zero to 255, yielding over 16 million combinations. However, Animator has only 262,144 possible colors. Therefore, when you adjust the HLS sliders for a color, then return to that color after selecting other colors, you will find that Animator often changes HLS settings to match the closest of the 262,144 available colors.*



Sliders Showing RGB Value for Blue



Sliders Showing HLS Value for Blue

If you adjust a register for a color already used in the picture, the screen reflects the change. For example, if you were to change the value in the color register used for the yellow balloon to the value for green, the balloon on screen would become green. You'll try this and other color adjustments in the next exercise. The RGB button should be highlighted in the palette panel. The numbers in the slider bars should give the RGB value of 51,3,51 for the current color, purple. Watch these numbers change when you select a different color.

---

## Adjusting RGB and HLS Values

<i>Right click current color</i>	Displays palette panel.
<i>Click mini-palette</i>	Select dark blue as current color, and see the RGB sliders change.
<i>Drag sliders</i>	Drag red and green sliders to zero, and blue to 63, to make pure blue.
<i>Click screen</i>	Pick up yellow (63,63,3) from screen as current color.
<i>Drag sliders</i>	Adjust RGB sliders to 0,63,0 so yellow balloon turns pure green.
<i>Click screen</i>	Select purple balloon and change RGB value to 63,0,63, true magenta.
<i>Click HLS</i>	Highlights HLS and shows 214,126,255, the HLS value for magenta.
<i>Drag slider</i>	Drag middle slider to raise and lower luminance.
<i>Drag slider</i>	Drag right slider to increase and decrease purity.
<i>Click RGB</i>	Shows current RGB value.

---

When you adjusted the sliders to pure blue, the current color slot, the mini-palette slot, the slot outlined in the color matrix, and the blue balloon all reflected the adjusted pure blue color. The current color slot, the slot outlined in the color matrix, and the yellow balloon all turned green when you selected yellow and adjusted the sliders again. And adjusting the purple color to magenta changed the balloon, the current color slot, and the slot outlined on the color matrix.

**TIP** *This type of fine adjustment is quite useful in design. You can assign colors to the various elements of your work and then quickly alter them to get the best contrast or emphasis. With all the surrounding colors in the image on screen, no guessing is necessary to choose the best color for each element.*

You've probably noticed that after you right click on a color to replace it, the status line indicates the color register number (also the number of the slot in the color matrix) and the RGB value of each color you move the cursor over. In the course of performing other operations,

you'll see similar information on the status line. While you are defining a cluster, potential start and end colors are identified by color register number and by RGB value. While you are selecting a tinting source (as you'll do in the next section), the RGB value of each color passed over is indicated on the status line.

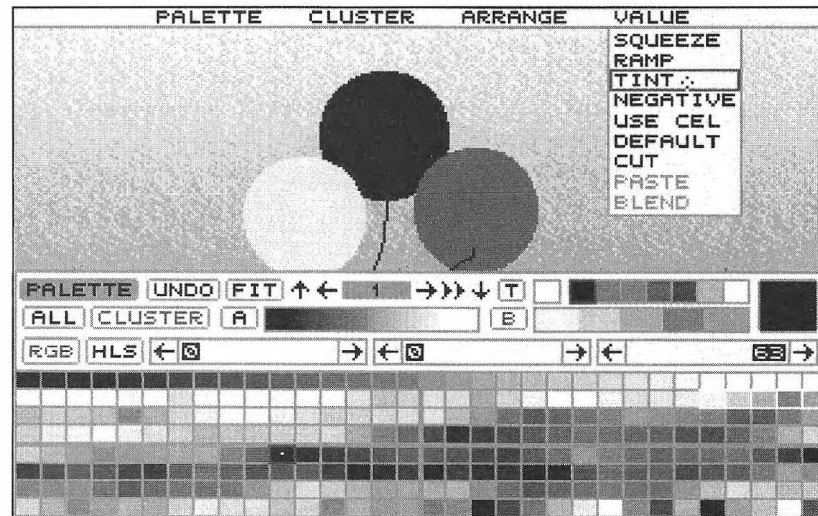
You don't ordinarily need to know the RGB value of a color or in which color register it's stored. Under certain circumstances, however, you do need to know which color matrix slot or color register a color is in. For instance, you may want a color to be transparent for pasting in one area of a picture and not in another. You can do this by putting two colors with identical RGB values in different slots in the color matrix and selecting one of them as the key color. This is described more fully in Chapter 5.

## Tinting

Tinting adds a color at a specified strength on top of existing colors. You can tint all the colors in a picture's palette or only the colors in one of the clusters. To tint only the colors in the current cluster, turn CLUSTER on (the default). CLUSTER is below UNDO on the palette panel. To tint all the colors in the entire color matrix, turn on ALL, which is beside CLUSTER on the palette panel.

Before applying a tint, you can specify whether you want the tint to be applied to the screen colors with FIT, which is to the right of UNDO. When FIT is turned on (the default), the program tries to preserve the appearance of the original screen colors as much as possible, despite your changing the values in their slots on the color matrix. It does so by changing the screen colors to the closest RGB values available in other slots of the color matrix. As a result, you may not see any perceptible difference in the colors on screen. With FIT turned off, any change to a slot of the color matrix containing a screen color shows up in that screen color.

If you were to apply a 30 percent green tint to the magenta balloon, it would no longer be pure magenta. However, if FIT were turned on, Animator would try to find another pure magenta — or a color as close to it as possible — in another slot in the color matrix. If such a color were found, it would be used to maintain the original color of the balloon, instead of tinting it.



*TINT Selected on VALUE Menu*

To apply a tint, select TINT on the VALUE menu of the palette menu bar. Next, select a color as the tinting source. Then set the tint strength, the maximum tint percent.

In the following exercise, you'll tint all the colors in the B cluster. This will affect the background of the picture because you'll turn FIT off. The CLUSTER button and the FIT button are on by default and the B cluster, which contains the background colors, should already be selected. When the dialogue box appears, just accept the default tint strength of 50 percent.

## Applying a Tint

Click **FIT**

Turns off FIT.

Open **VALUE** Select **TINT**

Pass cursor over slots in first row of color matrix and observe the status line.

Click **color matrix**

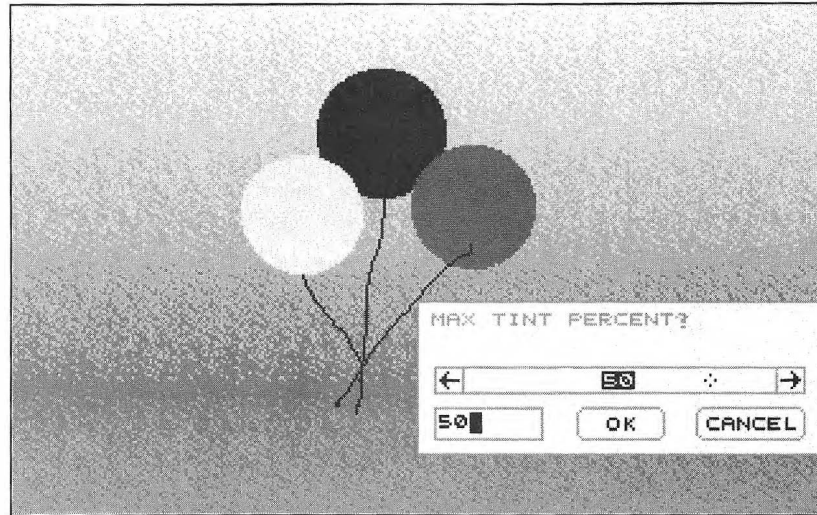
Click when status line reads 55, 55, 55 (fifth slot from right).

Click **OK**

Accepts default setting of 50 percent tint strength.

Return to home panel and display entire screen to see the full effect.

Because you turned FIT off, the tint was applied to the background colors on screen.



*Setting Tint Strength*

Tinting is a powerful tool for subtle effects. You can create the illusion that objects are being reflected in glass windows, car windshields, or other shiny surfaces. You can also create atmospheric perspectives, where objects become lighter or darker as they move away from you in space.

**TIP** *With the [T] time select button turned on, the tint is applied little by little, up to the maximum tint percent, so you can tint a sequence of gradually changing frames. You might, for instance, create a cloudy sky turning dark before a storm or an evening sky turning to night.*

## Sorting and Arranging Clusters

Tinting is just one of the effects you can achieve by processing a group of colors. Many of the items on the palette menus are either for the purpose of grouping the colors you want in a cluster or, once grouped, altering the cluster. (For a full description of the palette menus, see Chapter 4 of the *Autodesk Animator Reference Manual*.) The exercises in this section demonstrate several uses for clusters.

A good reason for sorting and arranging clusters is to organize your palette into groups of colors that belong in different parts of the

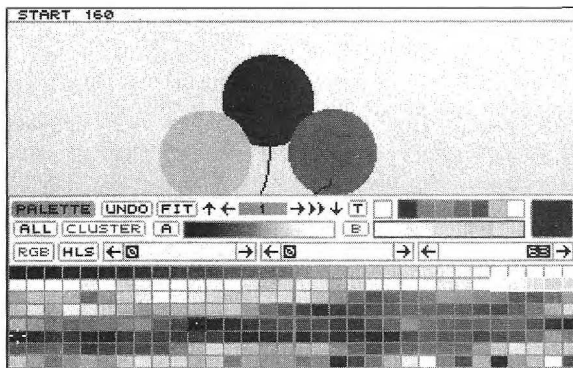


picture. Suppose that the background has a sky, an expanse of grass, and a brick wall. You might want a cluster containing the colors for the sky, another for the grass, and a third for the brick.

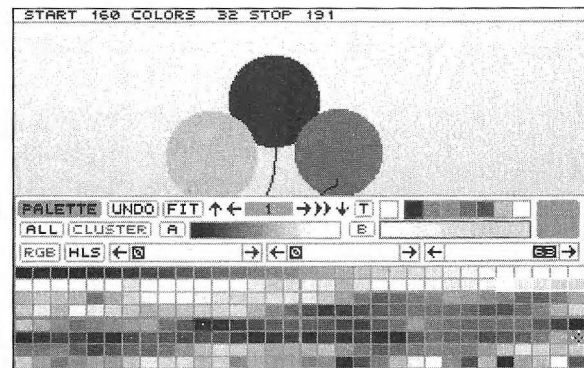
You might arrange one or more of these clusters in a gradient. You might also create a gradient to fill the text of the title. The first row of the default palette is a gray-scale gradient; it contains 32 levels of gray shifting smoothly from black to white. The default A cluster consists of all but the first slot, color register zero.

Although only two clusters can be in the cluster boxes at a time, you can effectively have more than two by arranging your color matrix into several ranges, any of which you can quickly define as the current cluster. Perhaps an element of the picture requires only a few colors. If you have these colors in a cluster or range, you can quickly bring them to the home panel when you're ready to work on the element.

The colors in the cluster you defined to cover the background were not sorted or arranged in any order. In the next exercise, you'll define a cluster in a convenient area of the color matrix and then arrange the colors in a gradient. The first step is to define the range of slots by selecting the start and end slots of the cluster, as you did earlier. Disregard the current colors in these slots. They will be replaced by the new gradient. Then select RAMP on the VALUES menu and select the start and end colors between which to create the gradient. The term for this process in the program is *ramping* two colors. The status line guides your selections with RGB or HLS numbers.



Selecting First Slot for New Cluster



Selecting Second Slot for New Cluster

---

## Creating a Gradient

Type @	Displays palette panel again.
Right click cluster	Select B cluster to be redefined.
Click color matrix	Define cluster by selecting first slot in sixth row (status line reads 160) and last slot in sixth row (last number on status line reads 191).
Open VALUE Select RAMP	
Click color matrix	Select sixth slot in second row as first color in gradient (RGB 63,51,63) and third slot in sixth row as the last color in gradient (RGB 39,3,39).
Return to home panel.	

---

Now you have a smooth gradient in the B cluster and a corresponding range in the color matrix. The new B cluster is on the home panel, ready for you to apply it with one of the gradient inks.

The RGB values for the colors in the sixth row of the color matrix have all been changed in order to create the gradient. Thus, the palette for this picture is no longer the same as the default palette. If you save the picture, its palette is saved with it. You can also save the palette separately, as a palette (COL) file, by selecting FILES on the PALETTE menu.

Follow the same procedures to set up palettes with whatever gradients your own projects call for.

**TIP** *If you are working on large projects in which you combine or switch between different palettes, devise a standard system for organizing your gradients and other color arrangements. Otherwise, you'll waste time trying to figure out where they are in the color matrix. For example, you might always define the gradient for the background as the second row of the color matrix. A helpful visual reference is the vertical center line that divides each of the eight rows into 16-slot halves.*

When you save a picture or palette file, the RGB values for the entire color matrix are saved with it, but the locations of the ranges of new clusters are not saved with the file. Consequently, if you restore

defaults (with RESET on FLIC menu), the A and B clusters revert to their default ranges of slots, even after you load another flic or picture file. The default A cluster contains the first row of the color matrix, except for the first slot (color register zero). The default B cluster contains the last four slots in the fourth row plus the first 26 slots in the fifth row. So unless you've changed the RGB values of colors in these slots, the gray-scale gradient will be in the A cluster box and the rainbow of colors in the B cluster box. You can define your own default clusters in a DEFAULT.FLX file or in a settings file, but that only saves two custom clusters. If you systematically locate the gradients or other cluster arrangements for a picture, you'll be able to easily find them again.

In the following exercise, you'll apply the new gradient with `r grad ink` to create the illusion that the balloons are spherical. `R grad ink` has a unique option: `CENTER`. You can set a center from which the colors radiate out and a radius distance at which the gradient repeats. Set the center a little to the upper left for each balloon, so the effect is that light is hitting the balloons from the same source.

---

### Contouring the Balloons

*Right click* **TILE**

*Click ink window*

*Select* `r grad ink`.

*Click* **CENTER**

*Turns centering option on.*

*Move cursor Click screen*

*Click to set center when crosshairs are a bit up and right of magenta balloon's center, as shown in the illustration below.*

*Move cursor Click screen*

*Click to set radius just large enough to enclose magenta balloon.*

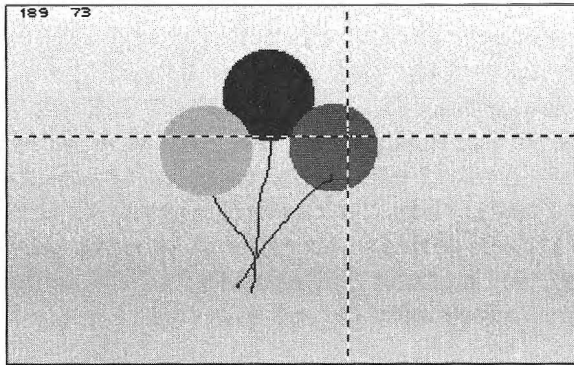
*Return to home panel.*

*Click* **FILL** *Click screen*

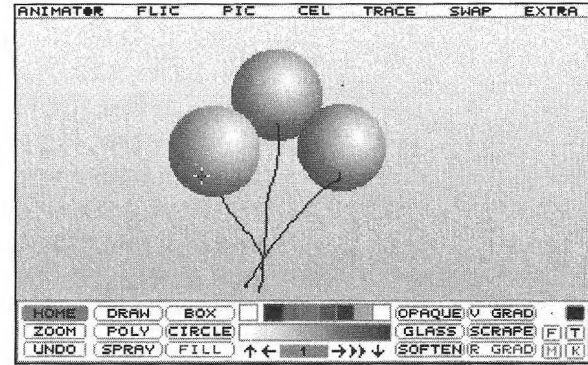
*Click inside magenta balloon to fill it with radial gradient.*

*Set center and radius and fill the blue balloon with the same radial gradient ink; repeat for green balloon.*

---



*Establishing Center Point for Rgrad ink*



*Balloons Filled with Radial Gradient Highlights*

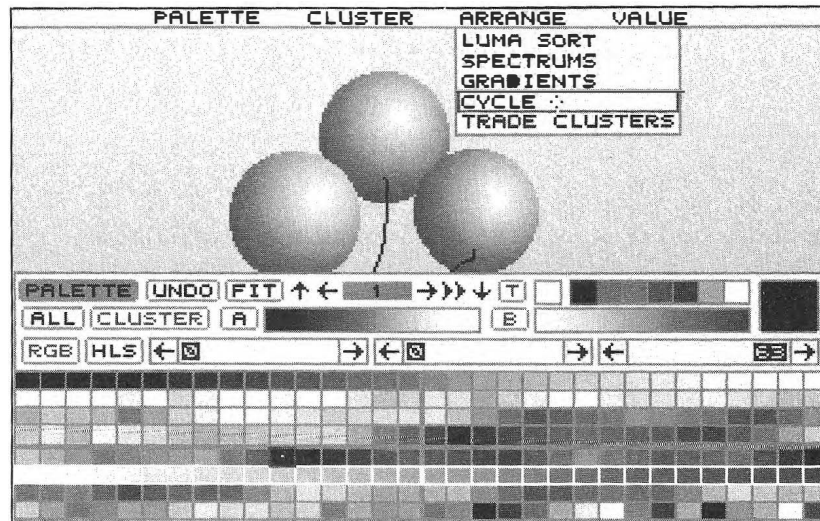
Unless you reset the center each time, you'll get bands of color radiating from the original center.

**MORE** *Depending on the outline to be filled with the radial gradient, r grad ink can create a variety of illusions. Filling a box or trapezoid can give a sunstruck effect to the side of a wall.*

## Color Cycling

*Color cycling* is a popular type of animation. Shifting colors create an illusion of movement which can be subtle or quite dramatic. Color cycling is also the basis for a variety of special effects, such as rain falling and sunsets flooding the sky. Chapter 10 covers color cycling techniques in depth.

In Animator, color cycling is achieved by shifting the colors in the selected cluster (and the corresponding color matrix slots) to the right, with the color on the right end becoming the leftmost color. To do this, select CYCLE on the ARRANGE menu of the palette menu bar and either shift the colors on one frame or over a sequence of frames. To move through a complete cycle over multiple frames, turn on the [T] button and set up a flic containing the same number of frames as there are colors in the cluster before selecting CYCLE.



*CYCLE Selected on ARRANGE Menu*

The FIT button's setting affects color cycling the same way it affects tinting. If FIT is off, the on-screen colors cycle along with their corresponding color matrix slots and the cluster. If FIT is on, the program will try to maintain the original on-screen colors by reassigning them to the shifted color matrix slots. You may see a slight shudder, as the colors start to shift and then go back to the same arrangement.

The results of color cycling depend on the tool and ink used. For example, a shape drawn with the poly tool and filled with v grad ink contains all the colors in the cluster at once and all are shifted when cycled. This is true of all the tools that draw closed shapes and for all the gradient inks. In contrast, a shape filled with one cluster color in opaque ink shifts to the cluster color on its right the first time it is cycled and goes through all the cluster colors sequentially if animated. The spray tool and the gel tool produce shifting dots of color scattered over the screen, while the draw tool and the drizzle tool make freehand lines of moving color. The text tool offers many possibilities for interesting effects, especially when combined with optics moves.

The next exercise demonstrates how to cycle the colors in the gradient you applied to the balloons in the previous exercise. Because you used radial gradient ink, the colors on screen will cycle out from the center

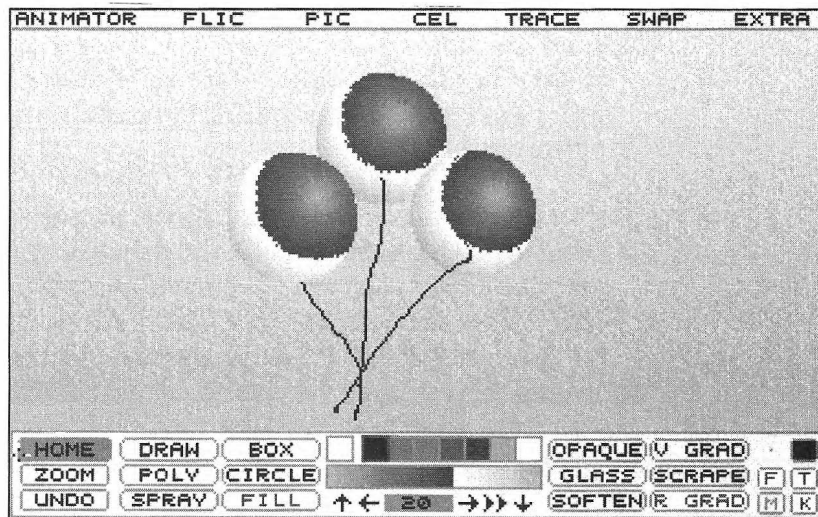
of each balloon. FIT should still be turned off and the B cluster, containing the gradient used on the balloons, should be highlighted.

---

### Cycling Colors

Right click cluster	Displays palette panel again.
Click [T]	Turns on time select button.
Open <b>ARRANGE</b> Select <b>CYCLE</b>	Displays time select panel.
Right click frame control icon	Displays frames panel to set number of frames for flic.
Right click total frames box	Enter 32, because the cluster has 32 colors.
Right click screen	Returns you to time select panel.
Click <b>PREVIEW</b>	
Return to home panel.	

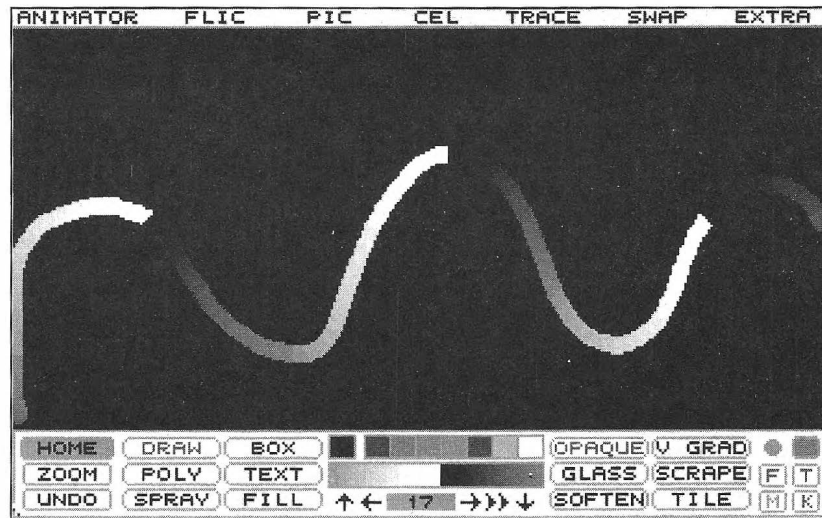
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*Color Cycling the Balloons*

**TIP** *To cycle the colors in more than one cluster, you can render the first cycle, change to another cluster, and render again. For example, if you used a different gradient for each balloon, you could render the flic three times, each time cycling the colors in another balloon. The result would be the simultaneous cycling of the three different clusters.*

To see the difference between turning FIT off or leaving it on when you color cycle, you can try this. On the palette panel, select the gray-scale cluster, turn FIT off, and select CYCLE DRAW from the PALETTE menu. Then on the home panel, select a fat brush, draw an undulating line, and turn on the [T] button. Go back to the palette panel and select CYCLE on the ARRANGE menu, create 32 frames for a flic, and turn the play speed down to zero on the frames panel. Render the flic. The illusion of pulsing energy should result. Repeat the exercise with FIT turned on.



*Pulsing Energy*

## Cutting and Pasting Colors

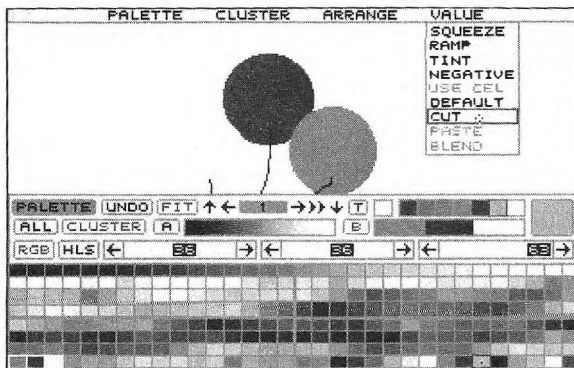
Often a project calls for pasting or compositing elements onto backgrounds that have different palettes. In such a situation, you may need to copy colors from one palette to another to maintain the colors you want. Otherwise, the colors will be exchanged for the closest colors that are available in the other palette. Copy colors between palettes by *cutting* and *pasting* the cluster that contains them, using first CUT and then PASTE on the VALUE menu of the palette menu bar.

The last exercises in this chapter illustrate how to cut and paste colors from one palette to another. You'll paste a cel of the orange, blue, and yellow balloons you drew earlier onto a valley on the moon, the picture





**TIP** If you prefer pressing keys to clicking, you could have restored the defaults and loaded the *BALLOONS.GIF* file by typing: *FRYPFL <double click on filename> <spacebar>*.



Cutting the Cluster



Pasting the Cluster

In the next exercise, you'll load *MOON.GIF* from the \AA directory or wherever you keep the sample GIF files that came with Animator. You'll lighten the background to give it some atmosphere for the balloons to float in. Then you'll look at the balloons on the moonscape without adjusting the palette. Finally, you'll see the difference after pasting the colors needed for the balloons.

## Pasting Colors

Load *MOON.GIF* and return to home panel.

Right click cluster  
Click cluster matrix

Displays palette panel again.  
Select last color in first row of color matrix as current color.

Return to home panel.

Click **FILL** Click screen

Click on sky to fill it with pale blue colored atmosphere.

Open **CEL** Select **MOVE**  
Right click screen

Balloons appear in colors available on moonscape palette.  
Cancels move, so you can paste saved colors.

Display palette panel again.

Open **VALUE** Select **PASTE**

Pastes orange, blue, and yellow in cluster and lower left color matrix slots.

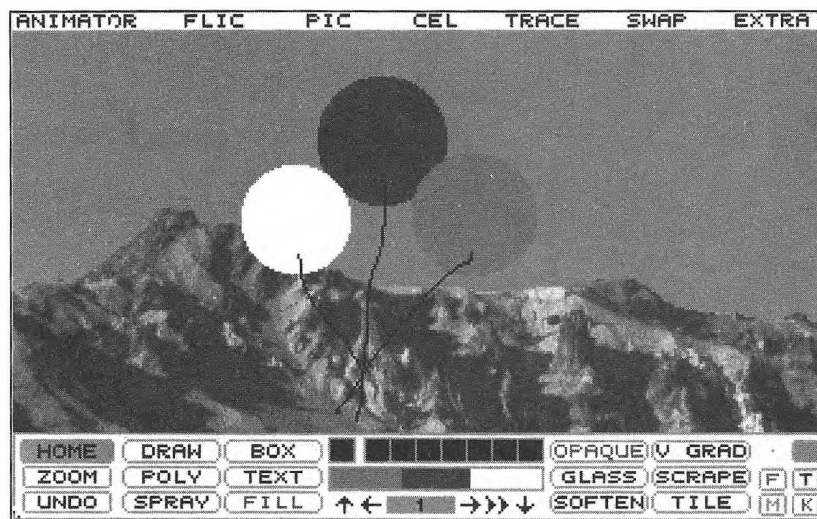
Return to home panel.

Open **CEL** Select **PASTE**

Right click **screen**

Pastes balloons onto moonscape in their original colors.

---



*Balloons on Moon*

This method of combining palettes lets you control where the changed colors are placed in the color matrix.

**TIP** *Another simple but effective method for combining large palettes is to make a two-frame flic with the two pictures that use different palettes. Then select ONE PALETTE from the PALETTE menu. Animator chooses the best possible color mix to maintain the colors of both images, but puts the colors in no particular order in the color matrix.*

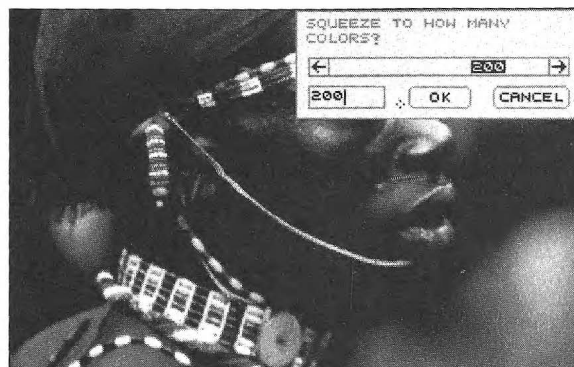
### ***Squeezing the Palette***

If the palette to which you are copying colors already uses all the slots in the color matrix, you'll have to *squeeze* the palette first to make room for colors from the other palette. Squeezing keeps as many colors as possible for the original palette but deletes some of the finer shadings.

You can experiment by squeezing the palette of the sample Animator file SAMBURU.GIF. Here's what you might try. First, make sure ALL is highlighted on the palette panel and select **UNUSED COLORS** on the **CLUSTER** menu to find out how many, if any, slots are available for new colors. Then select **SQUEEZE** on the **VALUE** menu to squeeze the palette to 200 colors and observe the result on screen. If you see no changes, squeeze the palette again to 100 colors.



*Checking Unused Colors*

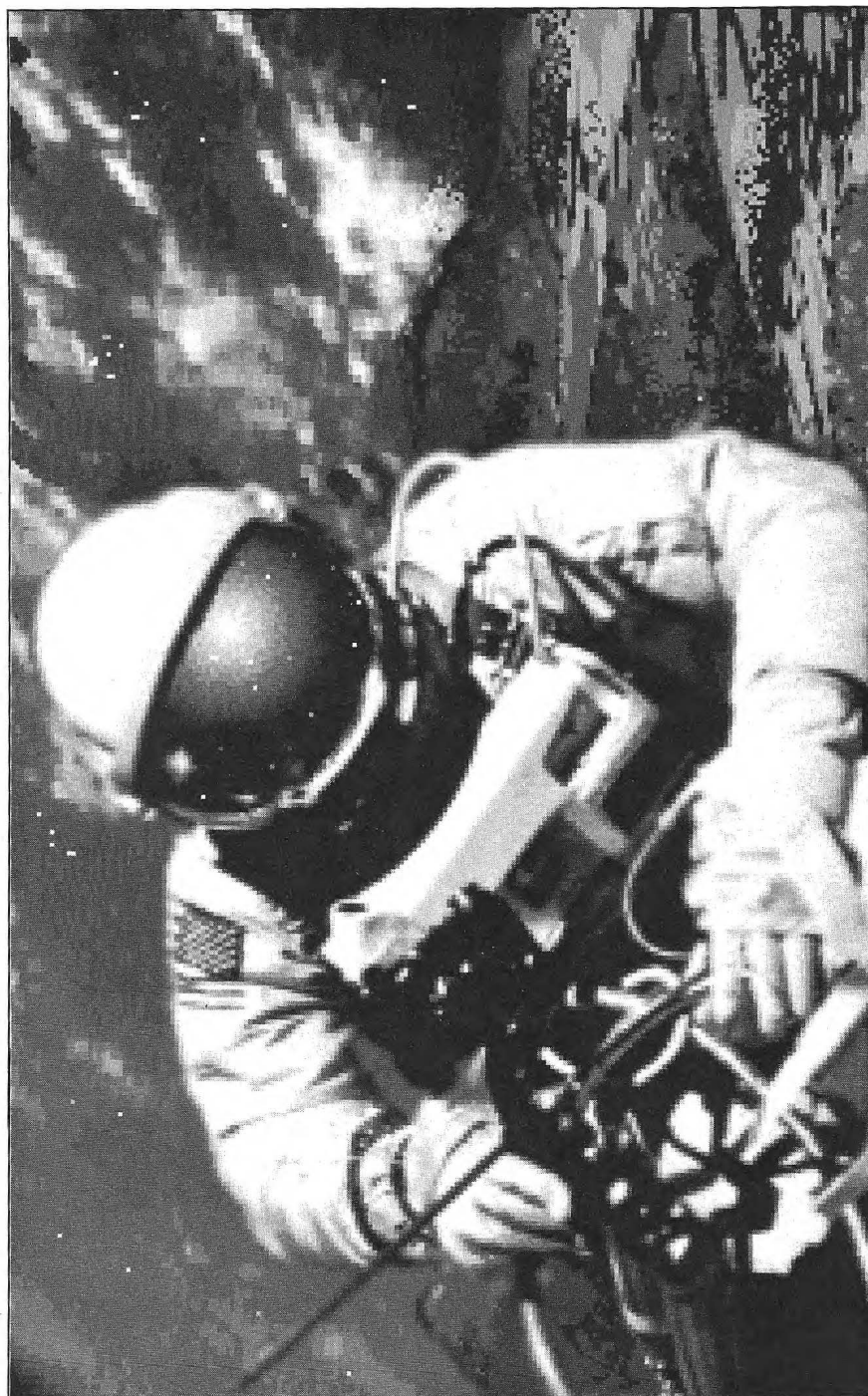


*Squeezing the Palette*

## Next Steps

This chapter has been a basic introduction to color in Animator. Chapters 13 and 14 go into more detail about combining different palettes.

In Chapter 5, you'll begin to feel like a professional animator as you select cels (or parts) of your drawing and move them over a background.



*Seeing Stars*

# Cel is for Selection

Animator cels make it easy to select and manipulate parts of your drawing on screen. But the term *cel* actually derives from classic animation, where each moving element is drawn on a transparent sheet of *celluloid*. The cel — Tinker Bell fluttering in midair or Wile E. Coyote falling off a cliff — is placed over the background, and the element is repositioned during the course of an animation sequence to simulate movement. A complicated sequence might require many layers of celluloid, each moving element drawn on a separate sheet.

The cel essentially serves the same purpose in Animator by means of graphic data in the *cel buffer* instead of on celluloid. You can draw a moving element once and copy it, move it, turn it upside down, mirror it, zoom it in and out, and launch it on complex motion paths. You can also layer cels by *compositing*, combining several in one flic.

The cel, however, serves a larger, more versatile purpose in Animator. Selecting a cel is the way you select an object or part of an object to work on separately from the rest of the image. The object may be a geometric shape such as a star, a freehand shape, some text, perhaps just a few pixels drawn randomly on the screen. The cel may consist of an object you've drawn in Animator, scanned in as a line drawing or photograph, or converted from another program.

Moreover, the reason for selecting a cel is not always to put it in motion. You may want to copy only part of an object on the same frame; for example, to create a drop shadow. Or you may need to copy part of an object to another frame: perhaps you've scanned in a photograph of the Paris skyline but you want only the Eiffel tower for another picture.

The *key color* is the equivalent of the transparent celluloid surface, the part not painted on. Any area of the cel that is in the key color is

treated as if it is transparent; the rest of the cel is opaque. Any areas of the background which are in the key color are also treated as if transparent. By manipulating the key color you can give the impression that a cel is moving over or beneath another image.

This chapter reviews the basic techniques for selecting, copying, and repositioning cels. You'll explore the key color using the sketch of the house you made in Chapter 2 and try out two more moving elements for the layout. You'll see how to paste a cel beneath other objects and how to do a simple optics movement with a cel.

## Key Color and the Cel

The basis for understanding how key color works is to remember that it is the one color you can make transparent. Setting up the key color is fundamental for achieving the effects you want when you select a cel and when you paste it. Is it your intention to pick up the object on the cel and not the colors or shapes near it? If so, you need to surround it with the key color. After pasting the cel, do you want to see through part of the object? Does the animation call for the cel to pass through, behind, or below other objects? These effects are determined by the key color. Similar effects in compositing flics are the result of managing the key color.

**NOTE** *The [K] button controls whether the key color is opaque or transparent. The default setting is on, making the key color transparent. When the [K] button is off, the key color is opaque like any other color.*

### **Key Color and Color Register Zero**

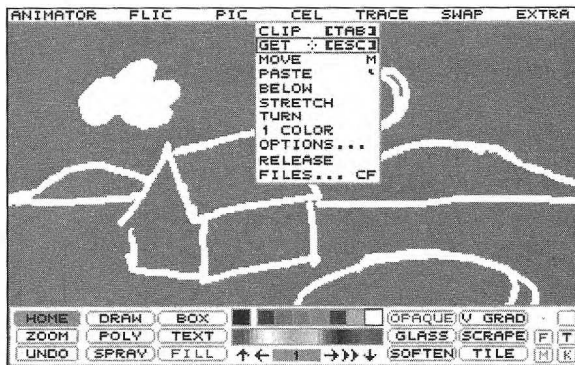
Although the key color typically is the background color, it need not be. However, the simplest way to start out is to make the background the key color and change it only when you need to do so for special pasting or compositing effects.

Register zero in the color matrix (slot 1) is the default location for the key color and the default color is black (RGB 0,0,0). Whenever you reset the program, the default color is restored to the key color slot on the home panel and in slot 1 in the color matrix. As a result, after resetting, the color of the blank screen is black. (The color matrix and color registers were described at length in Chapter 4.)

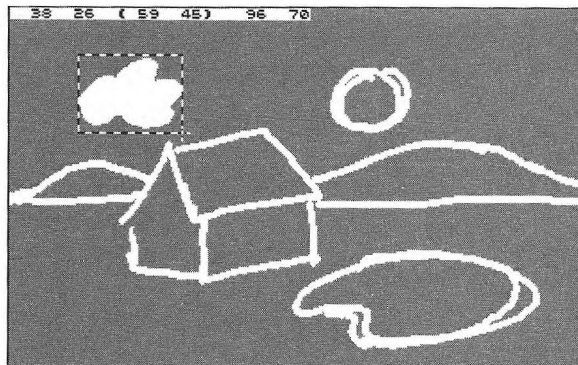
**TIP** *In most computer animation systems, color register zero is reserved for the transparent color. When compositing flics with different palettes, overlays are much simpler if both flics are using color register zero for the key color.*

In Chapter 2, you changed the key color to gray and applied it to the background of the picture, making that color transparent wherever it appeared on screen. You made a cel of the cloud, erased the original cloud, and then moved the cel around on the screen. You did not, however, change the value in color register zero to the new key color. The 0,0,0 RGB value remained the key color, the default black background you see when you reset the program.

Suppose that now, sometime later, you decide to go back to the layout, make a cel of the cloud, erase the original cloud, and try manipulating this moving element again. You'll see what happens in the following exercise. On resetting the program and loading the layout (either the HOUSE01.GIF file you created in Chapter 2 or the IN-CHP02.GIF file from the IN DISK), you'll notice that the key color on the home panel is not gray, but the default black background color. Unless you coordinate the default key color slot with the background color, you won't be able to erase part of the screen by painting over it with the key color or treat the background as if it were transparent. Nor will many of the cel techniques work correctly.



*The CEL Menu, GET Selected*



*Getting the Cloud Cel*

---

## Default Key Color and Background Color

Type **fry**

Open **PIC** Select **FILES**



Load either HOUSE01.GIF from Chapter 2, or IN02HOUS.GIF from the IN DISK, from your \AA\IN directory.



Load the layout from Chapter 2, HOUSE01.GIF, from your \AA\IN directory.

Notice that the key color is black, the default.

Click **mini-palette**

Select white as the current color.

Click **FILL** Click **screen**

Fill cloud with white opaque ink.

Open **CEL** Select **GET**

Click **screen**

Set first corner of rectangle up and just left of cloud.

Click **screen**

Set second corner of rectangle down and to right of cloud, enclosing it.

Open **CEL** Select **MOVE**

Click **screen**

Picks up cloud cel.

Move **cursor**

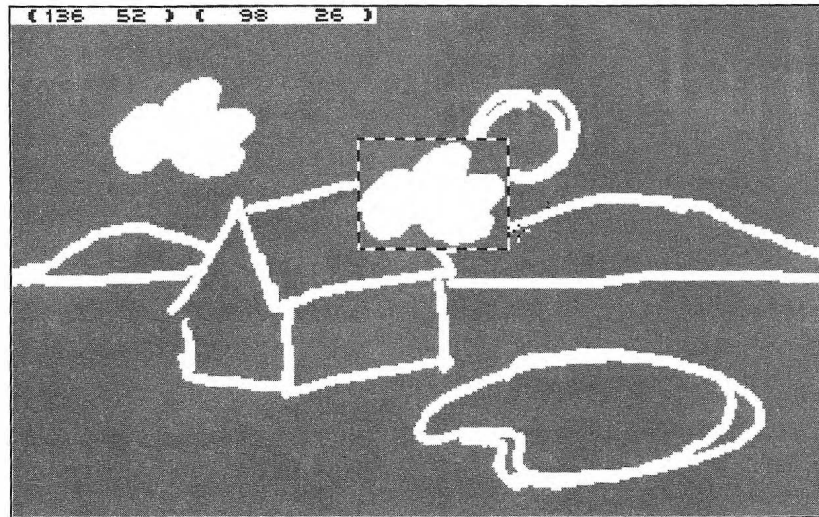
Move it around, over roof of house, over sun.

Gray background of cel is not transparent because it is not the key color.

Right click to cancel the cel move.

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*Cloud Cel Surrounded by Opaque Background Color*

Because the gray background is not the key color, performing cel operations produces very different results from those in Chapter 2. You can't paint over the background with the key color unless the two are the same color. Not so obvious, perhaps, is what happens if the object on the cel is not surrounded by the key color. As you just saw, the gray within the rectangle of the cel area is opaque; wherever it moves it blocks off the white outline of the sun or rooftop.

### ***Changing the Value in Color Register Zero***

You can easily change the key color to the original gray by right clicking to select the key color slot and clicking on the background color. But when you know that the key color will remain the same throughout the creation of a flic, it's convenient to change the value in register zero to the background color. The key color will then be saved with the picture.

In the next exercise you'll check the RGB value in register zero of the color matrix and then change it and the key color to the background color. The key color should already be selected as the current color.

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### Changing the Value in Color Register Zero

<i>Right click cluster</i>	Displays palette panel with key color slot and first slot in color matrix outlined in red, and RGB sliders showing 0,0,0.
<i>Click screen</i>	Select gray background as current color. Its slot near middle of row 1 in color matrix is outlined in red and its RGB value shows in sliders.
<i>Right click color matrix slot 0</i>	Selects color register zero to be changed.
<i>Click screen</i>	Select gray background color to replace black in color register zero, which is currently the key color. The other gray slot in row 1, outlined in red, is still the current color.
<i>Click key color</i>	Makes gray in color register zero the current color.

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There are now two slots in the color matrix with the same RGB value, the color of the gray background. Yet only one slot contains the key color, color register zero. The gray background color on screen is not the key color but is still the same color value as the other matrix slot.

In the following exercise you'll change the sky to the key color. You won't see any change in color on screen, because both the key color and the original gray color have the same RGB value. But when you select the cloud again and move it around, its background will no longer be opaque. By checking which slot is outlined on the color matrix when you pick up the gray color from the screen, you'll be able to determine that in fact there are now two grays used in the picture, and only one is the key color.

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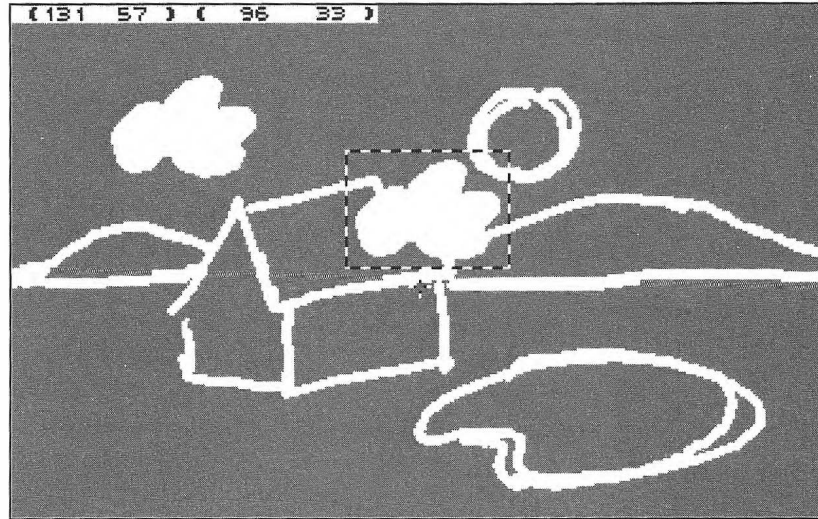
### Changing the Sky to the Key Color

Return to home panel.

<i>Click FILL</i>	Click on sky above line of hills to fill with key color.
<i>Press &lt;escape&gt;</i>	Get cel of cloud again, now with its background in key color.
<i>Type m Click screen</i>	Move cel of cloud across screen again; it's no longer opaque.
<i>Right click</i>	Cancels cel move.
<i>Right click cluster</i>	Displays palette panel again.
Check which slot in the color matrix contains the grays of the sky, the roof, and hills by clicking each in turn to make each the current color.	

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Both the sky color and the key color are the color in color register zero. So the gray surrounding the cloud on the cel is now transparent. The rest of the gray areas on screen that you did not fill with the key color are still filled with the color from the other matrix slot.



*Cloud Cel Surrounded by Transparent Background Color*

Later in this chapter, you'll make the sun set to see the difference between the transparent gray of the sky and the opaque gray of the hills, house, and pond.

## Selecting a Cel

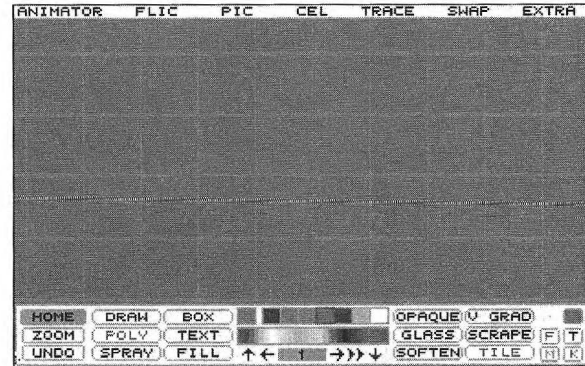
There are three ways to place a cel in the cel buffer so that you can animate it or create static effects, such as tiling. These are the items you can select from the CEL menu to capture cels: CLIP, GET, or FILES (to load a cel file). This section covers CLIP and GET. Later in this chapter you'll load and save a cel file (CEL).

To copy the entire image on the screen to the cel buffer, use CLIP. This method is the simplest when what you want to make into a cel is alone on the screen and the key color is the background color. Clipping a cel copies the entire screen, except for the key color portions, to the cel buffer. GET allows you to isolate an object or part of it from other objects. You've used GET to copy rectangular areas of the screen to the cel buffer, picking two corners of a box to delineate the area.

When you use GET, it's hard not to capture a bit of the surrounding background. This is sometimes an important difference between CLIP and GET. For example, if your intent is to tile the screen with a rectangular cel, you may be surprised at the results of CLIP versus GET, as the next exercise illustrates. Don't be overly careful when you use GET to select the orange rectangle.



*Getting a Rectangular Tile Cel*



*A Tiled Rectangle*

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### Clipping Rectangular Tiles

Open **SWAP** Select **CLIP**  
Type **x**

Copies sketch to swap screen for safekeeping.  
Clears screen, key color covering background.

Click **mini-palette**  
Click **POLY** Click **screen**

Select orange as the current color.  
Draw small orange rectangle in middle of screen, right click to set.

Open **CEL** Select **CLIP**

Copies single rectangle to cel buffer.

Click **TILE**

Open **PIC** Select **APPLY INK** Floods screen with opaque orange ink, no space between rectangles.

Undo and repeat, using GET instead of CLIP, and the result is separated rectangles, as illustrated.

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When you clipped the cel, the rectangle was captured so precisely that no background at all became part of the cel. Tiling the screen with

such a cel covered it completely because each edge of a rectangle adjoined the edge of another. However, when you set the area of the cel manually with CEL GET, your hand is less precise, so that some of the background often becomes part of the cel.

## **Moving and Pasting a Cel**

You have a number of options for moving and pasting cels. You have many choices on the CEL menu alone. You can move a cel without pasting it on the screen using MOVE. You can also move a cel and paste it in one operation, using either PASTE, which you've encountered in previous chapters, or BELOW, which creates the impression that the cel is beneath the other images on screen. With TURN, you can move a cel before or after rotating it and then paste it, all in one operation. Similarly, you can stretch or reverse a cel with STRETCH, moving it before or afterwards, and then paste it on the screen.

For powerful results, these effects can be carried out over a sequence of frames when the [T] button is on. And as later chapters demonstrate, all the spins, turns, and other optical effects on the optics panel can be applied to cels.

Why would you bother with MOVE if you can move the cel before pasting it with the other options? You may occasionally want to experiment with a series of moves to see how they'll work out. For example, you might have tried moving the cloud, decided it should be bigger to cover the sun more completely, and redrawn it before pasting it. It's often simpler to set the cel in its initial position with MOVE before using PASTE or BELOW, with the [T] button on. Another good reason for using MOVE is to line up a cel at the starting point before applying the options on the optics panel to the cel.

## **Pasting a Cel Below Another Object**

To create the illusion that a moving element passes behind or through part of a scene, use BELOW on the CEL menu. The procedure for moving and pasting a cel below other images is the same as for PASTE. However, because the cel is visible only when it passes under the key color, you need to set up the appropriate portions of the image in the key color, as in the earlier exercise.

The next exercise illustrates how to use BELOW. On the layout, you'll move the sun down and set its end position below the mountains to create a sunset over 30 frames. Earlier, you changed the gray of the sky to the key color, but not the gray of the mountains. As a result, the sun will be visible only when it is still in the sky.

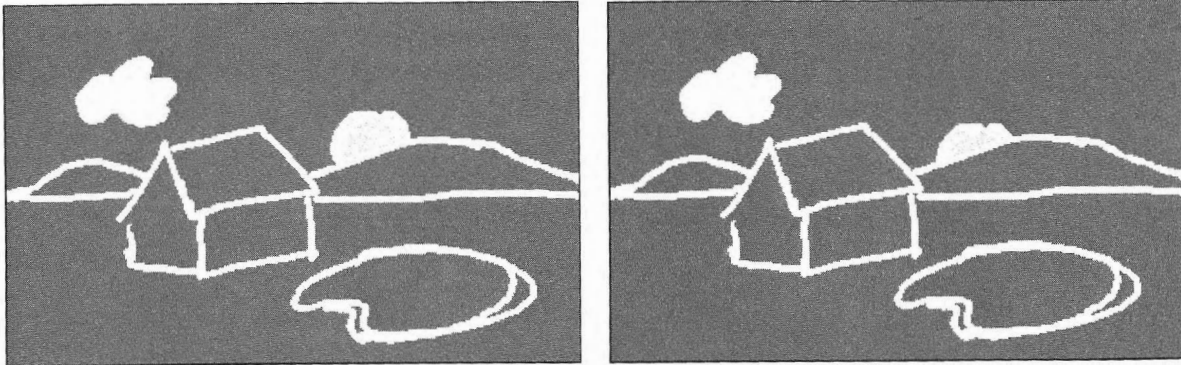
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### **A Moving Sunset**

<i>Open</i> <b>SWAP</b> <i>Select</i> <b>PASTE</b>	Brings back layout sketch.
<i>Click</i> <b>OPAQUE</b>	
<i>Click</i> <b>cluster</b>	Select a yellow gold color from cluster.
<i>Click</i> <b>FILL</b>	Click several times inside sun to cover all the gray with yellow gold.
<i>Press</i> <b>&lt;escape&gt;</b>	Set two corners of rectangle to get entire sun in cel.
<i>Click</i> <b>BOX</b> <i>Click</i> <b>key color</b>	Paint over sun with key color.
<i>Click</i> <b>[T]</b>	Turns on [T] button.
<i>Open</i> <b>CEL</b> <i>Select</i> <b>BELOW</b>	Click screen and move sun down until below top of mountains. Until pasted or rendered, the entire sun is still visible.
<i>Click</i> <b>screen</b>	Sets final position of sun and displays time select panel.
<i>Right click</i> <b>frame control icon</b>	Displays frames panel.
<i>Right click</i> <b>total frames box</b>	Create 30 frames.
<i>Right click</i> <b>screen</b>	Returns to time select panel.
<i>Click</i> <b>PREVIEW</b>	Check cel's movement and return to time select panel.
<i>Click</i> <b>RENDER</b>	Creates flic of sunset.

Play the flic.

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*Sun Setting Behind Mountains*

**TIP** *To create a sunrise instead, you can first move the sun below the line of the mountains with CEL MOVE, turn on the [T] button, and then move it up over a sequence of frames with CEL BELOW. Or if you want the sun to end up where it was originally, you can create a sunrise by following the steps in the exercise and selecting REVERSE on the time select menu.*

**MORE** *In your own work, after arriving at the effect you want for a moving element such as this one, you can enhance it — perhaps tinting the sky over time to sunset hues as the sun sets and then darkening to night.*

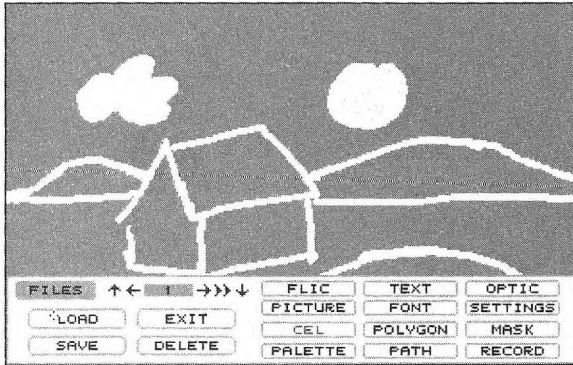
## Moving a Cel on a Path

Pasting a cel over a sequence of frames limits you to moving it in a straight line, which can give a simplistic effect. The cloud moves straight across the sky to cover the sun; the sun moves down behind the mountains. The CEL menu options let you test these moving elements. But to move a cel along a path that turns and curves, you need the options on the optics panel to describe the path. The next series of exercises animates a fish leaping out of the pond. Its movement is the result of such a path.

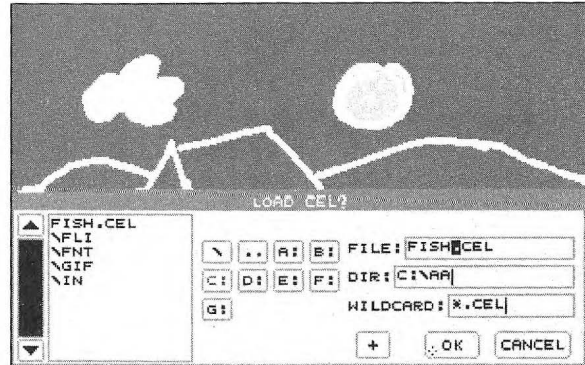
### *Loading a Cel File*

Your original Animator disks included a sample cel file, FISH.CEL. You'll load it next so you can move it along a path in the following exercises.

Assuming you installed FISH.CEL in the main AA directory, you'll change from the default \AA\IN directory to the parent AA directory to load the file. If you saved the cloud as HOUSE01.CEL in Chapter 2, it should appear in the file selector window for the \AA\IN cel files; if you haven't saved any cels yet in the \AA\IN subdirectory, the window won't show any cel files.



*Files Panel Set for CEL Files*



*File Selector Showing Main AA Directory*

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## Loading a Cel File

Continue from previous exercise.

Click [T]

Turns off [T] button.

Click up arrow

Displays frame 1 of flic.

Type **sc**

Copies frame 1 to swap screen.

Type **x**

Clears screen.

Open **CEL** Select **FILES**

Displays files panel, set to select cel files.

Click **LOAD**

Displays file selector, listing cels in \AA\IN, the current directory.

Click [..]

Displays the parent directory, the main Animator directory.

Double click **FISH.CEL**

Displays cel momentarily as it loads into cel buffer.

Return to home panel.

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The fish cel appears briefly on screen in its default position, surrounded by a bright blue background. It's been loaded into the cel buffer, replacing the cel of the sun. Now you can treat it like any cel you create in Animator.

### ***Changing the Cel's Orientation***

The fish is facing to the right. Before setting the fish in motion, you'll adjust the cel so that it angles upward. By selecting **TURN** on the **CEL** menu, you can rotate the cel by moving the cursor. The status line will indicate the degree of clockwise rotation.

Then you can change the background color of the cel to match the gray key color, so only the fish itself will be visible when it makes its leap. The key color should still be the current color.

---

### **Changing the Cel's Orientation**

<b>Open CEL Select TURN</b>	Fish appears again.
<b>Click screen Move cursor</b>	Click outside and right of cel's blue background; move fish counterclockwise to 45-degree angle up (status line 315 degrees).
<b>Click screen</b>	Click inside the cel's blue background. Move fish to a new position.
<b>Right click screen</b>	Completes cel turn.
<b>Click FILL Click screen</b>	Click inside cel's blue background.

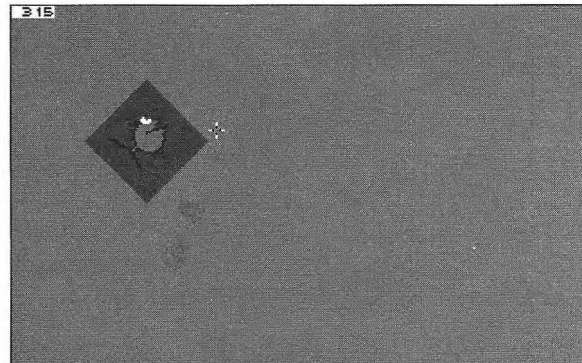
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Now the fish should be rotated as illustrated and its blue background should be the medium gray of the key color.

**TIP** *If you're making a series of incremental turns to a cel, the object degrades less if you begin each turn from the original position.*



*Fish Cel Pasted in Default Position*



*Fish Cel Rotated*

### ***Saving the Changes***

Although you've rotated the fish and changed its background color on screen, the cel buffer still contains the fish as it was when you loaded the file. In order to use the changes, you must clip it into the cel buffer. You'll do this in the next exercise. You'll also save the new version of the fish as a cel file.

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### **Keeping the Changes**

Open <b>CEL Select CLIP</b>	Puts changed cel into the cel buffer.
Open <b>CEL Select FILES</b>	
Click <b>SAVE</b>	Displays the file selector, set to save cel files in \AA directory.
Click <b>\IN</b>	Changes to \AA\IN directory.
Click <b>[+]</b>	Saves file as FISH01.CEL.

Return to home panel.

---

Forgetting to clip alterations back into the cel buffer is a common mistake. If you've altered a pasted cel to put it through a move on the optics panel, as in the next exercise, you don't want to be surprised by finding the original cel reappearing despite all your preparations.

### ***Moving the Fish***

The fish looks ready to leap up, doesn't it? You'll set it in position in the pond before describing its path with the optics panel.

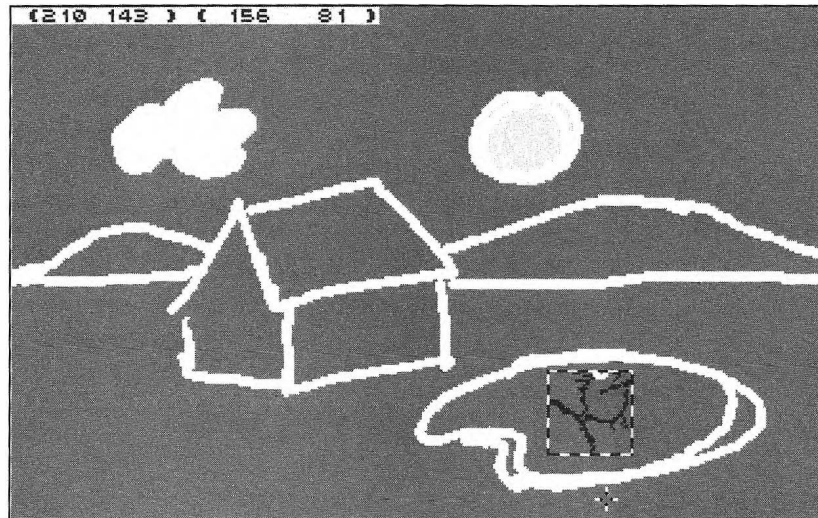
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#### **Moving the Fish**

<b>Type sp</b>	Pastes frame 1 of flic from swap screen.
<b>Open CEL Select MOVE</b>	Displays fish in new orientation.
<b>Click screen Move cursor</b>	Pick up fish and move it to middle of pond.
<b>Click screen</b>	Completes move.

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When you completed the move, the fish disappeared. The CEL MOVE didn't paste the cel on screen.



*Moving Fish Into Middle of Pond*

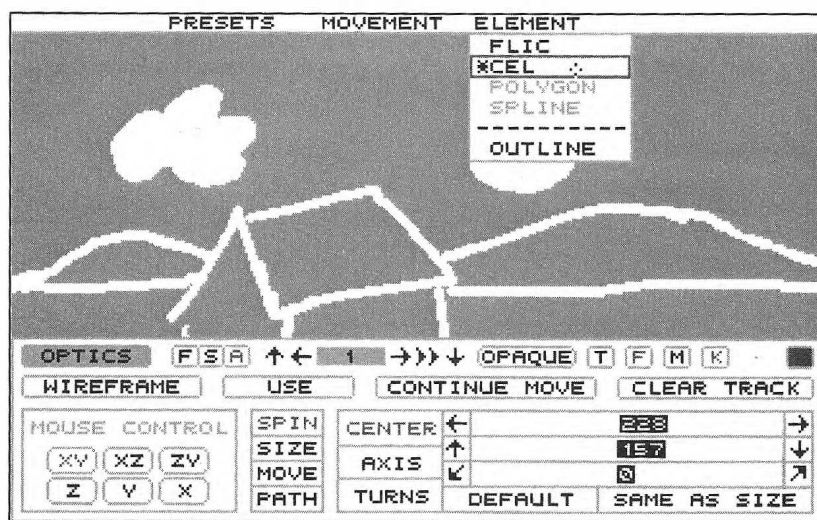
### ***Describing a Path***

Now you can make a path for the fish, starting from the pond and returning to it. First, you'll change the current color so that the path will show up against the gray while you're creating it on the optics panel. Then you'll clear all settings on the optics panel, make the cel

the moving element, and set its center as the pickup point for the movement on the path.

**TIP** *Whenever you want to create an optics motion, you should first clear out any prior settings to avoid peculiar results.*

By clicking on CEL on the ELEMENTS menu, you select the current cel as the element to be operated on by the movement, instead of the default FLIC. In this instance you want the center of the cel to move on the path, so you'll just click on CENTER, next to SPIN on the optics panel, and then click on DEFAULT, which defaults to the cel's center.



*Optics Screen, CEL Selected on ELEMENTS Menu*

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## Setting Up the Cel on the Optics Panel

Click **mini-palette**  
Type **o**

Select dark red as current color, for drawing the path.  
Displays optics panel.

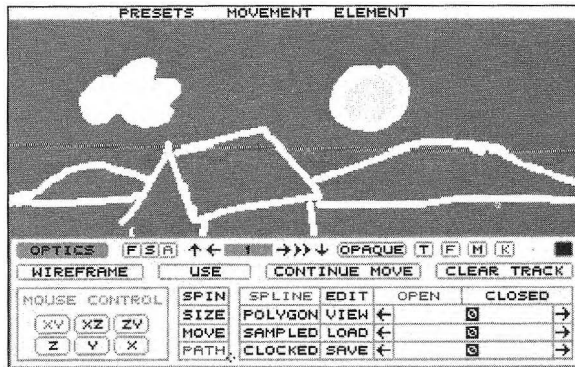
Open **PRESETS** Select **CLEAR ALL** Clears all settings on optics panel, as a precaution.  
Open **ELEMENT** Select **CEL** Selects cel as element to be operated on by optics options.

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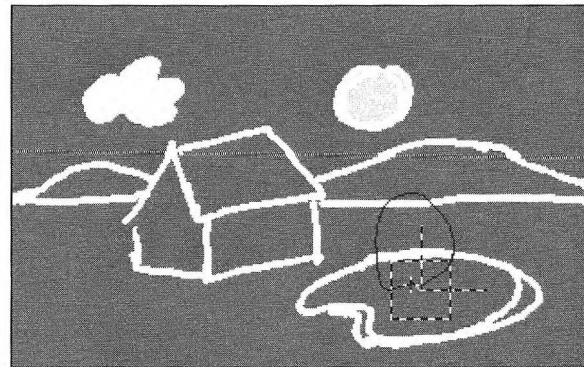
Click <b>CENTER</b>	Sets intersection of X, Y, and Z axes for start of path movement.
Click <b>DEFAULT</b>	Sets default center, which is center of cel.

---

**NOTE** *The CENTER option only appears when SPIN or SIZE is selected, so you may sometimes have to select one of these to set the center, even if you don't plan to spin or resize the element.*



*PATH and OPEN SPLINE Options Set*



*Drawing the Path*

Now you'll draw the path as an open spline. When you select PATH, SPLINE and OPEN are the defaults. To draw the path, you first click on the screen. Then, as if you're using the spline tool, you click, draw a line segment, and continue clicking and drawing segments until you finish the path. Right clicking ends the procedure.

To check whether the path is correct, you'll select WIREFRAME to view the movement with a wireframe substituting for the cel. Then you'll go to the time select panel, preview the movement, and render it. You can use the same 30 frames of the sun setting.

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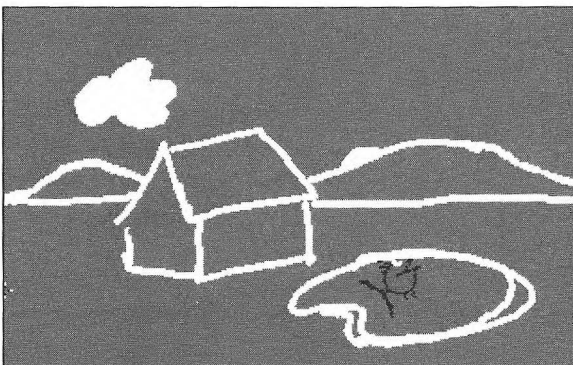
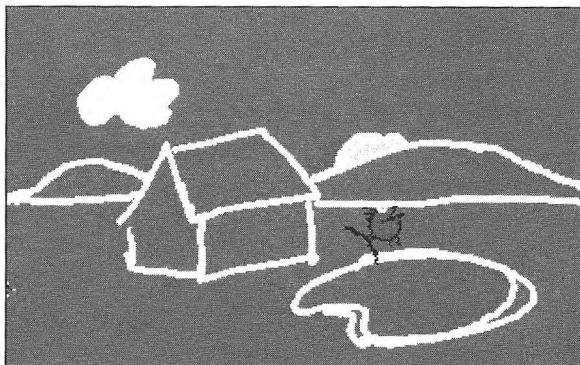
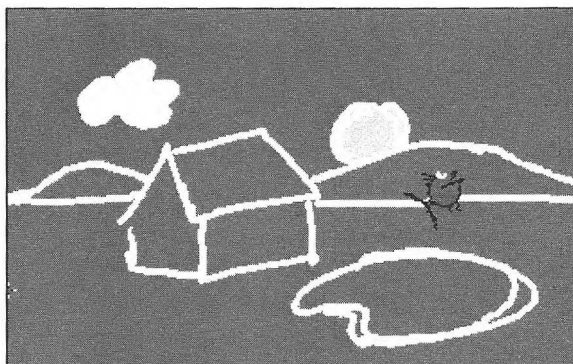
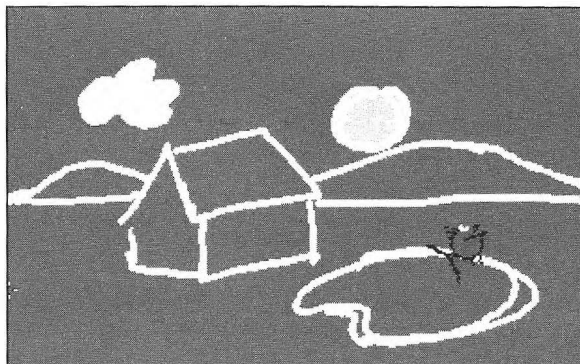
## Describing a Path

Click <b>PATH</b>	Highlights PATH and default options, SPLINE and OPEN.
Click <b>screen</b>	Click anywhere on screen to start operation.
Click <b>screen</b>	Draw line up, starting at center where the X and Y axes meet, curve around and back down into the pond, clicking at each change of direction.
Right click <b>screen</b>	Completes operation.

Click <b>WIREFRAME</b>	Displays wireframe of cel going through motion along path.
Click <b>USE</b>	Displays time select panel.
Click <b>PREVIEW</b>	
Right click <b>screen</b>	Returns to time select panel.
Click <b>RENDER</b>	Adds optics movement to flic.

Return to home panel and play flic.

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*Fish Leaping From Pond*

As you can see, the movement of the fish cel is added to the movement of the sun cel.

**MORE** *For a full-dress animation, you'd probably want to make a separate flic of the fish and composite it, making it start and return to below the surface of the pond. You might also want a more complex path than this one, perhaps using CONTINUE MOVE, as described in Chapter 12. To make a more realistic jumping fish, you could add an optics spin to the movement before rendering. To do this, you would select SPIN TURNS on the optics panel and set the number of turns on the Z axis, as described in Chapter 12.*

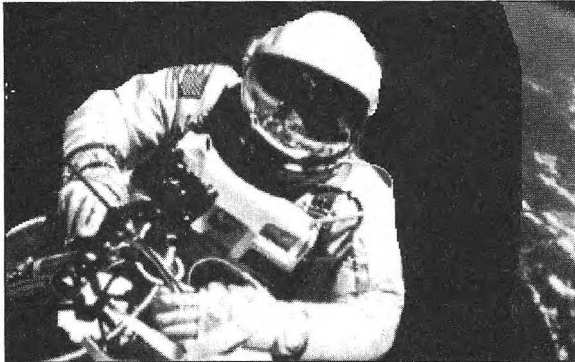
## Selecting Cels From Multi-Colored Backgrounds

One of the pleasures of working with computer graphics which may not be immediately obvious to novices is the opportunity to edit reality. You can add your imagination to photographs of people and places. You can capture moments and rearrange them more to your liking. To do so, you'll want to select cels from scanned photographs. You cannot always get at the part of a scanned image you want to select as a cel without initial preparation. In a photograph, the background consists of many colors blended together in a random pattern. You cannot change such a pattern into the key color with the separate tool. The image you want to select is likely to be an irregular shape in a mixture of colors.

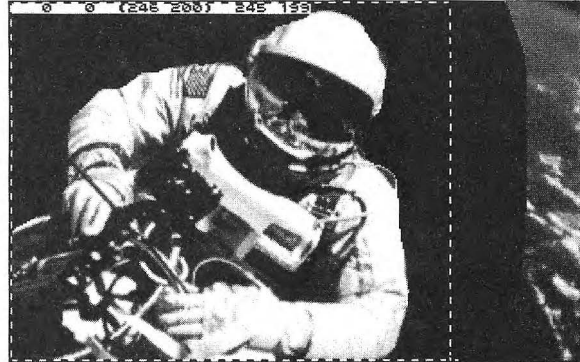
The previous examples of selecting cels have all involved an image surrounded by the key color. Thus, whether you used CEL CLIP or CEL GET, whatever was in the key color was excluded from the image because it was transparent. The last exercise in this chapter demonstrates a fairly simple method for selecting a cel from a scanned photograph.

You'll load WALK.GIF, the sample picture of an astronaut supplied on your original Animator release disks. Then, to surround the figure with an area of screen in the key color, you'll use the shape tool with the filled option on and the key color as the current color. The shape tool lets you draw freehand while you hold down the left mouse button. It closes and fills the outline with the key color when you release the button. Work your way around the figure, drawing several overlapping outlines. You need to cover a large enough area of the background so you can put a rectangle around the figure to select the cel.

It's tricky to draw around the figure without leaving some of the background pixels in the cel. Don't be too concerned about this. You can clean up the cel later.



*Astronaut Surrounded by Key Color Shape*



*Getting the Astronaut as a Cel*

---

### Selecting a Cel From a Scanned Image

*Type* **fry**                      Resets Animator.

Load WALK.GIF from \AA or the directory you keep the sample picture files in.

*Type* **sc**                      Clips picture to swap screen.

*Click* **key color**              Selects key color as current color.

Replace spray tool with shape tool.

*Right click* **screen**              Displays entire screen.

*Use* **SHAPE**                      Hold down left mouse button to draw outline around astronaut enclosing part of background, as illustrated. The shape is filled with the key color when you release the button.

Repeat drawing shapes until the astronaut is surrounded by the key color.

*Press* **<escape>**              Set two corners of rectangle encompassing figure of astronaut.

*Type* **x**                          Clears screen.

*Type* **`**                          Pastes astronaut cel on key colored background.

---



You now have a cel of the astronaut you can use in another scene. You might, however, want to clean up the cel first. To do so, you would use a single-pixel brush and the draw tool, zooming in for a better view of the area you're working on.



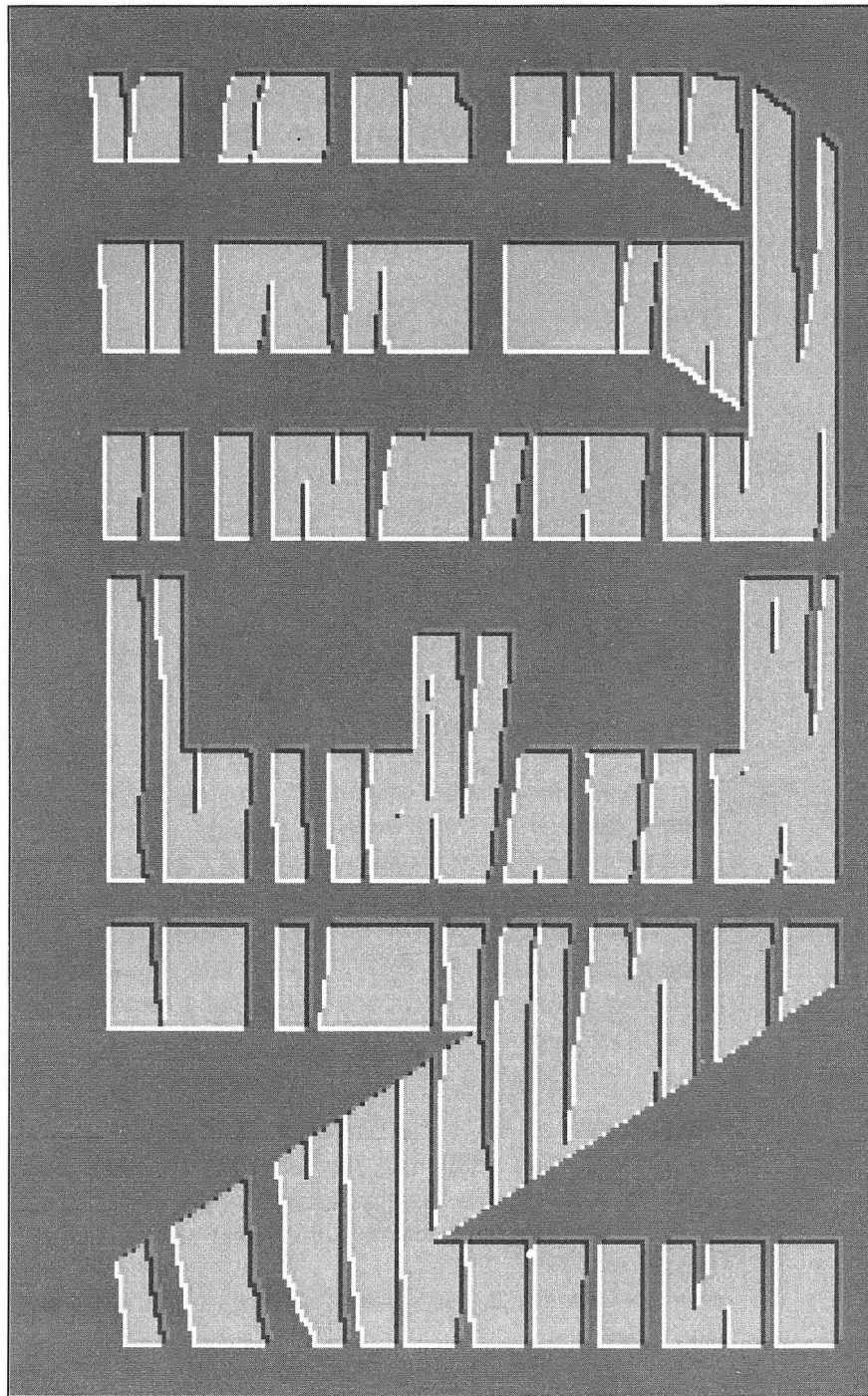
*Zooming Into Clean Up the Cel*

**MORE** *You might animate the astronaut, pasting the cel over a sequence of frames against a background of planets, comets, and asteroids. To produce an effect like the illustration at the beginning of this chapter, you would use the shape tool to outline the astronaut's face protector and fill it with the key color, change the background to a different color register, and use CEL BELOW with the [T] button on to move a reflection of cosmic objects across the face protector.*

## Next Steps

There's more about cels in Chapter 8. In Chapter 11 you'll use the fish cel again as the basis of a metamorphosis. And while this chapter introduces the optics effects you can create for cels, a full discussion of optics and the cel must wait for Chapter 12.

Next in Chapter 6, you'll learn how to create, edit, and animate text and titles.



*Big News!*

# Textual Exploits

A picture may be worth a megabyte of words in today's market, and an animation consists primarily of pictures for good reason. Nonetheless, text is a vital element. It is the clarifying agent — the labels on a chart, the key points of a sales talk, the dimensions of a widget, the credits at the end of a film. Text can be the spice that heightens a picture's impact, like the caption on an editorial cartoon. For corporate graphics especially, text is the meat in the sandwich.

Like most other animation programs, even very expensive ones, Animator is not designed to create long passages of text. The fonts, or typefaces, are mainly for display, rather than body text; they are best used for headlines and brief, dramatic titling effects. Animator's text editing capabilities are limited — adequate for adding and deleting characters. To create a passage of more than a few phrases, you are better off using a word processor and importing the file, as described later in this chapter.

Animator is designed to manipulate text graphically. You can scroll text in different directions, justify the alignment, slow down the pace, and edit before and after previewing the results. You tried out the text tool briefly in Chapter 3. This chapter covers both the text tool and the titling panel in detail. You'll explore the basic techniques for creating text, editing it, and animating it. In Chapter 9, you'll see how to create some special effects with titles.

## The Text Tool and the Titling Panel

You can use either the text tool's options on the drawing tools panel or the options on the titling panel to create and edit text in Animator. Several of the options are interchangeable, as shown in the following table. If you are pasting text to one frame only, use the text tool. However, if the text is going to be rendered on a sequence of frames, you must do so on the titling panel.

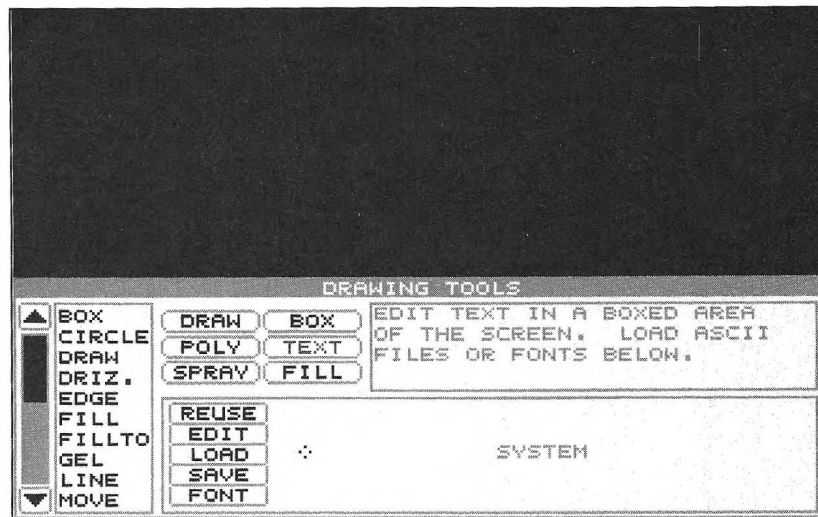
The most recent text you've entered is held in the *text buffer*, a temporary storage area. The text buffer may contain text entered via the text tool options, options on the titling panel, or a text file (TXT) you've loaded. Text remains in the buffer until you enter new text again or load a text file, even if you quit Animator or reset the program. Because you can enter text into the buffer from the text tool and then apply it with the options on the titling panel, you may end up working back and forth between the text tool and titling panel options.

Text Tool and Titling Panel Options		
<i>Text Options</i>	<i>Titling Options</i>	<i>Action</i>
TEXT	NEW TEXT	Create original text; replace contents of text buffer.
EDIT	EDIT TEXT	Change wording, change size or location of editing box, view font change; text buffer is updated but text is not pasted.
REUSE	PLACE WINDOW	Change wording, change size or location of editing box, view font change while scene is displayed; REUSE updates text buffer and pastes text; PLACE WINDOW only updates text buffer.
FONT	LOAD FONT	Change to different font.
LOAD	LOAD TEXT	Load Animator text file or ASCII file.

### ***The Text Tool***

The text tool is one of the tools in the default arrangement on the home panel. Clicking on the text tool selects it; you can then create new text.

Right clicking on the text tool displays the drawing tools panel, showing the text tool's options. These include REUSE, which brings back the contents of the text buffer against the image on the current frame and EDIT, which also brings back the contents of the text buffer but on a blank screen; LOAD and SAVE, which display the files panel set for text files so you can load or save them; and FONT, which lists the Animator fonts you can select.



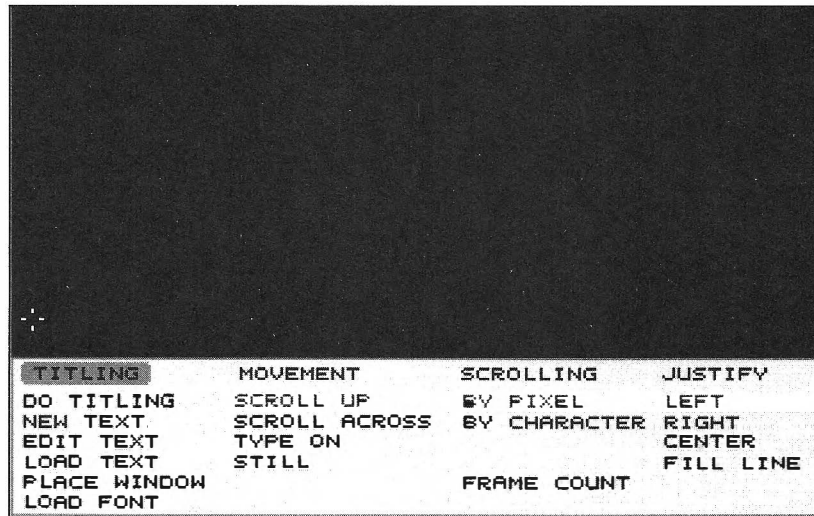
*Text Tool Options on Drawing Tools Panel*

When you enter text with the text tool, it is pasted on the current frame in the selected font and ink, in the current color. You can then treat the text like any other image. All the main screen menus and the items on the home panel are available for you to try out on the text. For example, after pasting text, you can apply one of the gradient inks to it with the separate tool, or unzagjagged lines of text.

### ***The Titling Panel***

The titling panel duplicates several of the text tool's options, with slightly different names. You can replace the contents of the text buffer by creating text with **NEW TEXT** or by loading a text file with **LOAD TEXT**. To edit the contents of the text buffer against a blank screen, you can select **EDIT TEXT**; to edit the contents of the text buffer against the current frame, you can select **PLACE WINDOW**. And to select a different font, you can use **LOAD FONT**. All of these options alter the contents of the text buffer, but do not paste text on the screen.

The titling panel also offers options for aligning and scrolling text. Unlike the text tool, the titling panel does not paste text until you set up these options and select **DO TITLING**. Then the time select panel is displayed so you can render the text, which you will do later in this chapter.



*The Titling Panel*

**TIP** *When you don't want to scroll the text, an alternative to rendering it from the titling panel is to clip pasted text as a cel and paste it over a sequence of frames, using **CEL PASTE** with the [T] button turned on. You can also make a cel of text the moving element on the optics panel to render it with optics movements.*

## Creating Text

To create text directly in Animator, define the corners of an editing box and type in the text. You already did this with the text tool in Chapter 3 when you put numbers and labels on the chart.

For the first exercise in this chapter,, you'll use the text tool to paste text on one frame of the **HOUSE.FLI** flic created in Chapter 2. If you make a typing error, use the arrow keys to move the cursor, use the backspace or delete keys to remove characters, and then enter the corrections.

---

## Pasting Text on a Picture

Type **fry**



Load IN06HOUS.FLI from your \AA\IN directory.



Load HOUSE.FLI from your \AA\IN directory.

Click **mini-palette**

Select dark blue as current color.

Click **TEXT**

Click **screen**

Set first corner of editing box above and to right of cloud.

Set opposite corner near sun, just above roof.

Click **screen**

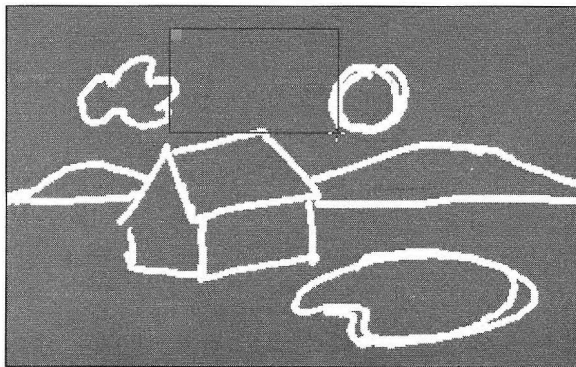
Type **Eden Estates**

Right click **screen**

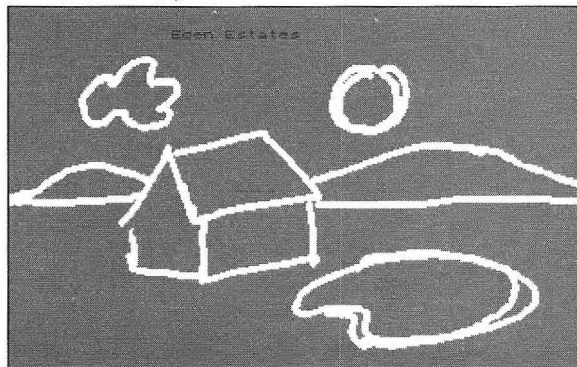
Pastes text on current frame.

---

Before pasting the text, you can move the editing box by clicking inside it and moving it with the mouse, then clicking again to set it in the new location. You can make the editing box larger or smaller by clicking outside it, and then setting two new corners. These adjustments are also possible while editing text, as the next exercises demonstrate.



*Editing Box Ready for Text*



*Text Pasted on Screen*

Once the text is pasted, it appears in the current color and ink. Creating text on the titling panel follows the same procedure; however, you only see the text while you're creating it. When you right click, it disappears, and the text is not pasted until you render the flic.

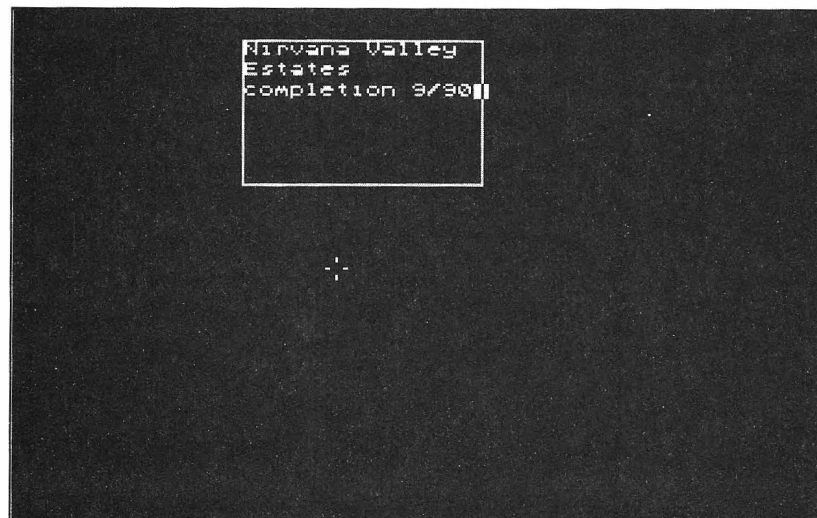
## Editing Text

Editing text in Animator means changing the text after it's in the text buffer. You can change the wording, change the size or location of the editing box, or change the font. The buffer's contents may be new, unpasted or unrendered text, the most recently used text, or a loaded text file.

If you want to clear out the contents of the text buffer entirely, you can simply create new text. But if you want to revise the contents of the text buffer, select the text tool's EDIT or REUSE options on the drawing tools panel, or one of the similar options on the titling panel. The following exercises show how to use the text tool's editing options.

### *Changing the Words*

The text you created in the previous exercise is now pasted on the screen. Next, you'll remove the pasted text and use EDIT to alter the contents of the text buffer.



*Changing the Words*



---

## Changing the Words

Continue from previous exercise.

<i>Open PIC Select</i> <b>RESTORE</b>	Removes text from screen, but it remains in text buffer.
<i>Right click</i> <b>TEXT</b>	Displays drawing tools panel.
<i>Click</i> <b>EDIT</b>	Displays contents of text buffer for editing. The text appears where you created it, but on a blank screen.
<i>Press</i> <b>&lt;home&gt;</b>	Moves cursor to first character on line.
<i>Press</i> <b>&lt;del&gt;</b> four times	Deletes first word.
<i>Type</i> <b>Nirvana Valley</b>	Inserts text and pushes "Estates" to the next line.
<i>Press</i> <b>&lt;pgdn&gt;</b>	Moves cursor down one full box, or in this case, just past last character as you have only one box full.
<i>Press</i> <b>&lt;spacebar&gt;</b>	Enters one space.
<i>Type</i> <b>completion 9/90</b>	
<i>Right click</i> <b>screen</b>	Ends editing procedure, but doesn't paste text.

---

As you can see, the text disappears after you right click to finish editing it. The comparable option on the titling panel is EDIT TEXT.

Text is wrapped to fit in the editing box, and when more text is entered than the editing box can accommodate, the text scrolls up, line by line. Don't be concerned if it scrolls out of the box; the next exercise demonstrates how to resize the box before pasting it.

The following table lists all the keys you can use to edit text.

<b>Text Editing Keys</b>	
<b><i>Press</i></b>	<b><i>Action</i></b>
<left arrow>	Moves cursor one space left.
<right arrow>	Moves cursor one space right.
<up arrow>	Moves cursor one line up.
<down arrow>	Moves cursor one line down.
<home>	Moves cursor to first character of a line.
<end>	Moves cursor to last character of a line.
<PgDn>	Scrolls down one full box of text.
<PgUp>	Scrolls up one full box of text.
<del>	Deletes character beneath cursor.
<backspace>	Deletes character left of cursor.
<ctrl + <key>>	Enters special symbol characters.

### ***Changing the Editing Box***

You can change the size and location of the editing box when editing or at the time you create the original text. The procedure is identical in either case. To change the size of the editing box, click outside it and then set two new corners. To move the editing box, click inside it, move the mouse to move the box where you want it, and click again. You can click and resize or move as many times as you need before right clicking to set your changes.

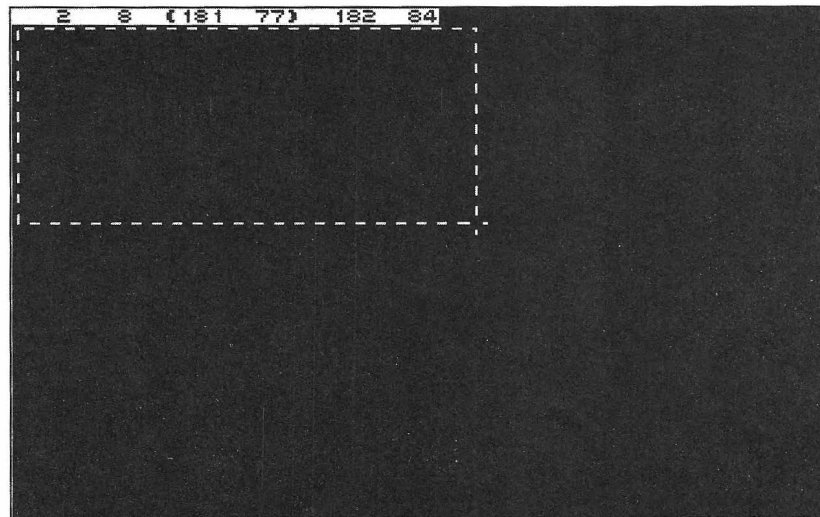
When you change the size of the editing box, the text is rearranged inside the new outline. Enlarge the editing box now, so all the lines fit on the screen.

---

## Enlarging the Editing Box

<i>Click</i> <b>EDIT</b>	Displays contents of text buffer.
<i>Click</i> <b>screen</b>	<i>Click</i> outside box to display crosshairs for redefining corners.
<i>Click</i> <b>screen</b>	<i>Set</i> a corner at upper left of screen.
<i>Click</i> <b>screen</b>	<i>Set</i> opposite corner near center of screen.
	The text reappears, wrapped to fit the new size. All text should fit on screen. If not, repeat the process.
<i>Press</i> <b>&lt;pgup&gt;</b>	<i>Scroll</i> top lines back into box, if necessary.
<i>Right click</i> <b>screen</b>	Returns you to drawing tools panel.

---

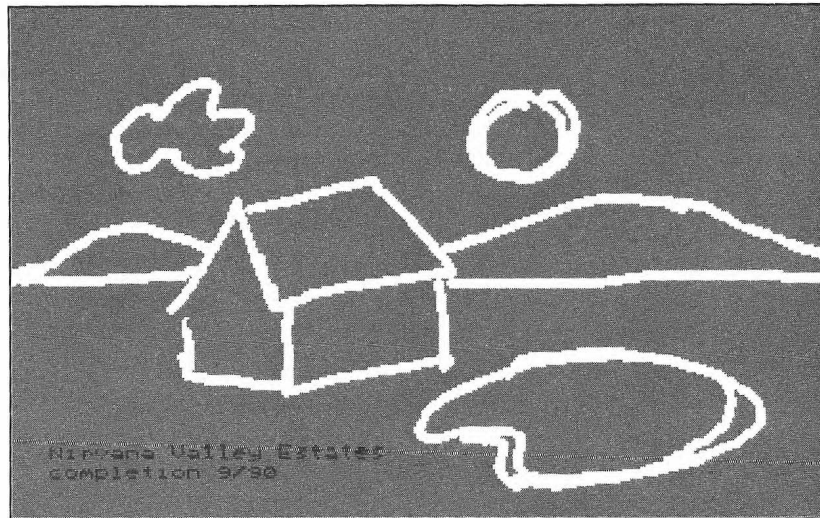


*Changing Size of Editing Box*

As before, when you finish editing, the results disappear.

To find out how the edited text looks against the background scene, you can select **REUSE** on the drawing tools panel or **PLACE WINDOW** on the titling panel. These options allow you to change text as well as resize and move the editing box.

In the next exercise, you'll view the text against the background scene, move the editing box, and view the results.



*Text Edited and Moved With Text Tool Options*

---

### **Moving the Editing Box**

<i>Click REUSE</i>	Displays contents of text buffer against background of scene.
<i>Click screen</i>	<i>Click</i> inside editing box to move it.
<i>Move cursor</i>	<i>Position</i> it at lower left of screen without overlapping house. You can move part of the editing box off the screen.
<i>Click screen</i>	Sets new position.
<i>Right click screen</i>	Pastes text and returns you to drawing tools panel.
<i>Right click screen twice</i>	Returns you to main screen and removes home panel so you can look at the text.

Display the home panel again when you're done.

---

Now the edited text appears in its new location, adjusted to fit the enlarged editing box.

### ***Changing Fonts***

So far you've been using the default system font. The size and shape of a font become part of the design. For your own animations, you'll no doubt want to experiment with different fonts.

Changing fonts is quite easy. Select FONT, the text tool option on the drawing tools panel, or LOAD FONT on the titling panel. The file selector is displayed for you to load a font. If you select FONT, you will see a sample of the font after loading. You can view the text in the new font by selecting EDIT or REUSE.

Animator provides 16 fonts on the release disks. On sending in the registration card, you receive two bonus disks containing more than 60 additional fonts.

**NOTE** *The ARMY24 font is all upper case characters. Lower case characters appear on the screen as blank rectangles. Several other fonts are also missing certain characters, which display as blank rectangles.*

### ***Removing Pasted Text***

Once text is pasted on the screen, you'll want to remove it before pasting a revision, unless you want to show both the original and the edited text at the same time. You have several choices for removal, depending on what you've done since creating the text.

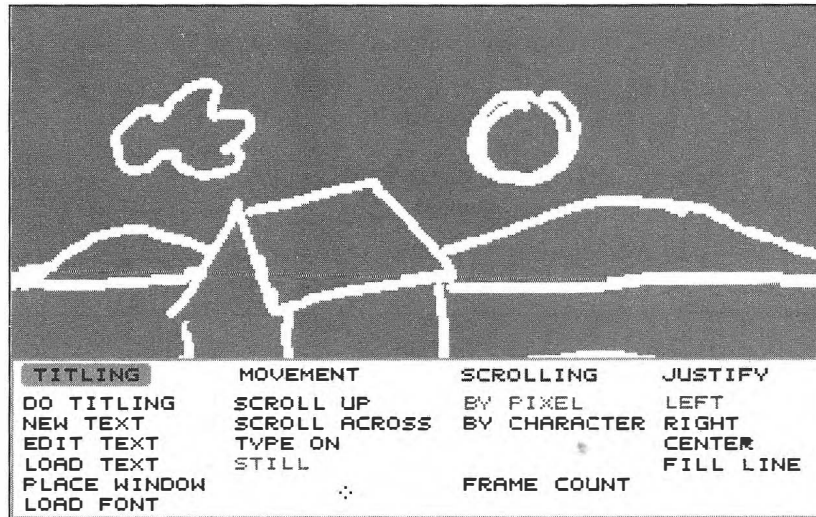
Text created with the text tool is pasted on the screen when it is entered into the text buffer, as in the first exercise in this chapter. To remove it immediately, you can select UNDO. You can also select RESTORE on the PIC menu, if creating the text was the only change you made to the picture and you haven't yet moved to another frame. If there is no background, only the text, you can always select CLEAR on the PIC menu.

If none of these methods is available, you can paint over the text using the box tool and opaque ink in the background color, provided the text is not superimposed on part of the image. An alternative method that ensures you remove only the text is to make the color of the text the background color using the separate tool.

Text created on the titling panel is not pasted until the flic is rendered. Until then, you can edit it without ending up with two versions on screen. After rendering, the most efficient method for removing the text from all frames of the flic is to turn on the [T] button, select SEPARATE on the PIC menu, and change the color of the text to the background color.

## Applying Text to a Flic

When you use the text tool, you can paste text only to the frame that is displayed, even if the [T] button is turned on. To paste text over a sequence of frames you must go to the titling panel.



*Titling Panel, STILL Selected*

In the next exercise you'll see how to paste the same text to more than one frame by selecting **STILL** on the titling panel. Later in this chapter you'll see how to create moving text with the titling panel's other options.

---

## Pasting Still Text

Open **PIC** Select **RESTORE**

Open **ANIMATOR** Select **TITLING**

Click **STILL**

Erases text.

Displays titling panel.

Selects option to paste text without scrolling it.

Click **DO TITLING**

Click **RENDER**

Displays time select panel for rendering text in buffer.

Pastes text to each frame of flic.

Return to home panel.

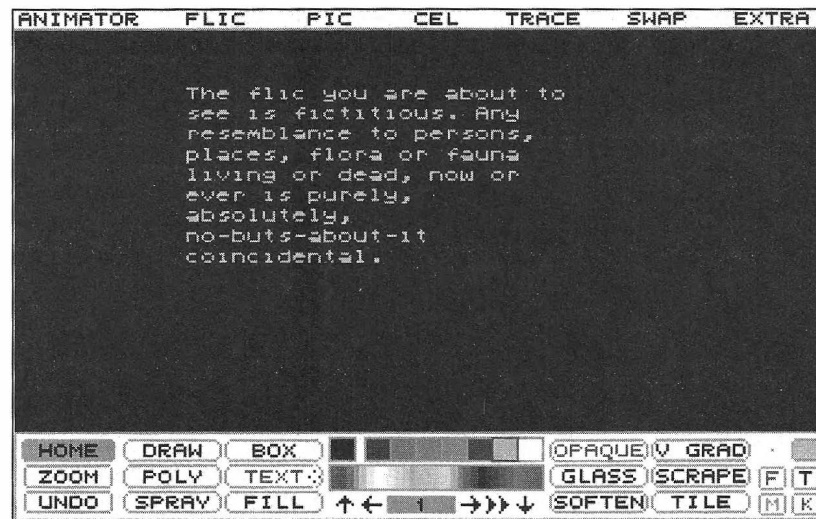
---

If you play the flic or move through it frame by frame, you'll see the same text in each frame.

## Text Files

The text you create in Animator can be saved in a standard ASCII (DOS) text file for permanent storage, as opposed to the temporary storage of the text buffer. Such files are commonly assigned a TXT file extension, which is the default text file extension in Animator. Any text in the buffer will be saved, whether you've pasted it or not. A saved text file can be loaded into the text buffer at any later time.

You can also bring ASCII text from a text editor or word processor into Animator. If you modified such text in Animator, you can save it under the same or a different name and extension. To save such a file, or any text file, select the text tool's save option on the drawing tools panel. (There is no comparable option on the titling panel.)



*Text for a Text File*

The following exercise shows how to save a text file. First you'll enter the text for a disclaimer most creative artists need at one time or another and then you'll save it.

---

## Saving a Text File

<i>Type</i> <b>fry</b>	Clears out flic, leaving one frame in default key color.
<i>Click</i> <b>TEXT</b>	Set an editing box large enough to hold text in illustration, then enter the text shown.
<i>Right click</i> <b>screen</b>	Pastes text.
<i>Right click</i> <b>TEXT</b>	Displays drawing tools panel.
<i>Click</i> <b>SAVE</b>	Displays file selector, set to save a text file (TXT extension).

Save the file as FICTISH.TXT and return to home panel.

---

The text you entered replaced the text previously stored in the buffer and is now also stored on disk. Later you may load the file into the buffer again and use it with either the text tool or the titling panel options.

## Importing an ASCII File

For passages of text longer than a few phrases, you'll probably prefer to create an ASCII file in a word processor. You can polish and make corrections in the word processor and save the finished text in ASCII format. Some word processing programs refer to this as "non-document," "text-only," or "programmer's" mode. Once the file is imported into Animator, you can move and resize the editing box, change the font, and use all of the text options on the drawing tools panel and on the titling panel.

To load a TXT file or to import text from any ASCII file, select the text tool's load option on the drawing tools panel, or LOAD TEXT on the titling panel. The text is brought into a default editing box that leaves a screen margin of about 30 pixels top and bottom and 50 pixels on each side. Animator wraps the text to fit the outline of this editing box. Do not insert carriage returns in the word processing program unless you want to break paragraphs or force line breaks in specific places.



## Animating Text

You've already seen how selecting STILL on the titling panel pastes stationary text onto a series of frames. You use other options on the titling panel when you want to animate text. The text can be a passage you create directly in Animator, either with the text tool or with NEW TEXT on the titling panel; or the text can be loaded from a file.

The general procedure for animating text is to decide which options on the titling panel you want to use, check the number of frames the program calculates for these settings, and select DO TITLING. Then, if necessary, you set up the number of frames on the frames panel and preview the animation on the time select panel. When all is ready, you render the flic. The order in which you make these preparations is not fixed, and you may find yourself returning to the titling panel to edit the text after previewing it.

### ***Basic Movements***

The titling panel offers three basic movements for text: *scroll up*, *scroll across*, and *type on*. The editing box is the boundary within which the text moves. Text scrolling up begins where you placed it in the editing box and disappears line by line at the top of the editing box. Text scrolling across begins where you placed it in the editing box and disappears at the left edge of the editing box. Text that types on gives the impression it is being typed one character at a time. It begins with the first character at the left edge of the editing box and reveals each character to the right in turn.

As you try out the text movements, experiment with different sizes and locations for the editing box. Where you choose to break a line or which font you use can vary the movement. Also, the options on the time select panel can produce interesting results.

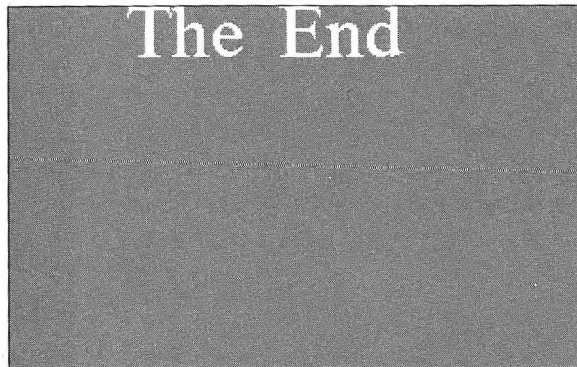
**TIP** Use REVERSE with SCROLL UP to scroll text down instead of up.

### ***Movement by Pixel or Character***

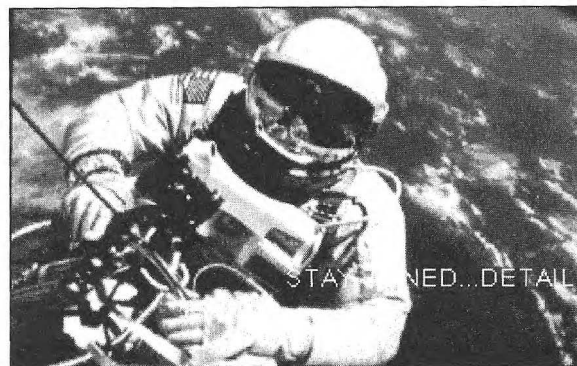
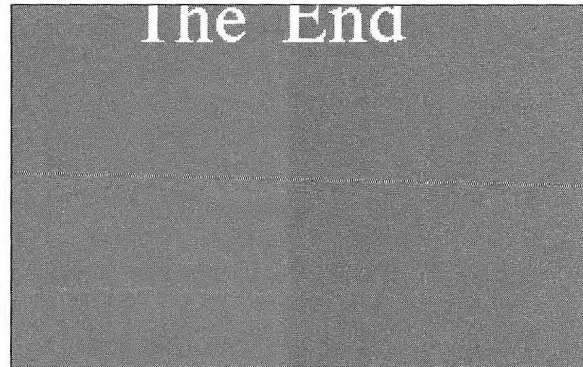
For SCROLL UP and SCROLL ACROSS, you can choose to make the increment of movement either pixel by pixel or character by character. Scrolling pixel by pixel is slower and smoother but requires more frames than scrolling character by character.

Scrolling one pixel at a time is most effective for scrolling text up. Scrolling up character by character can be jerky. Scrolling across character by character is often effective as well as efficient.

**TIP** *To alleviate the jerky effect of scrolling up character by character, try slowing the play speed and creating three or four times as many frames as needed.*



*Scrolling Up Pixel by Pixel*

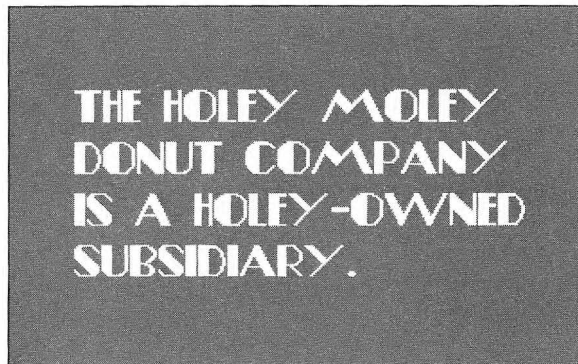


*Scrolling Across Character by Character*

### ***Justifying Text***

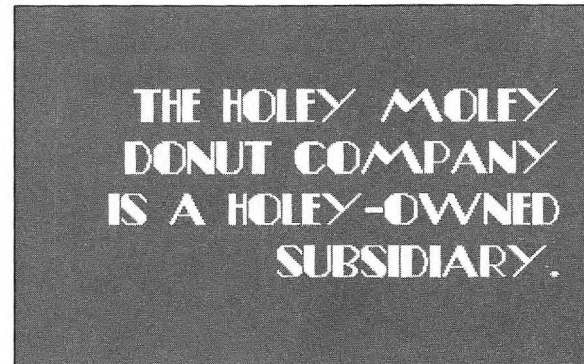
Before you select DO TITLING to preview or render a scrolling title, you can decide how to *justify* the text. That is, how do you want to align it within the editing box? There are four options: left, right, centered, and filled.

- Left justification aligns text along the left edge of the editing box.
- Right justification aligns text along the right edge.
- Centered text is evenly spaced on either side of an imaginary spot in the center of a line.
- Filled text is spaced out so that no matter how many characters it has, each line extends to both the left and right edge of the editing box.

A dark gray rectangular box containing white text. The text is aligned to the left edge of the box. The text reads: "THE HOLEY MOLEY DONUT COMPANY IS A HOLEY-OWNED SUBSIDIARY."

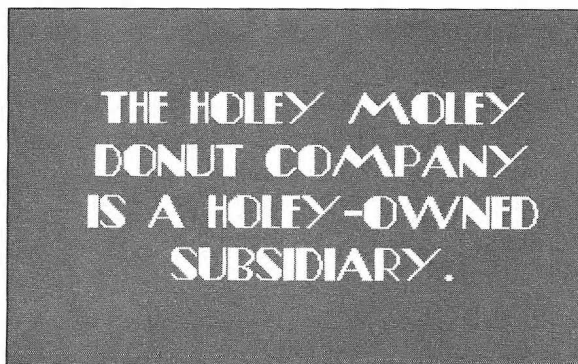
THE HOLEY MOLEY  
DONUT COMPANY  
IS A HOLEY-OWNED  
SUBSIDIARY.

*Left Justification*

A dark gray rectangular box containing white text. The text is aligned to the right edge of the box. The text reads: "THE HOLEY MOLEY DONUT COMPANY IS A HOLEY-OWNED SUBSIDIARY."

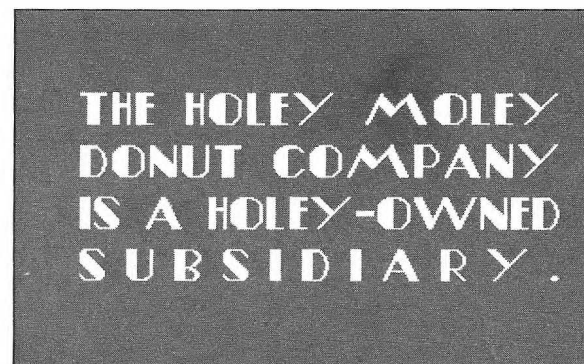
THE HOLEY MOLEY  
DONUT COMPANY  
IS A HOLEY-OWNED  
SUBSIDIARY.

*Right Justification*

A dark gray rectangular box containing white text. The text is centered within the box. The text reads: "THE HOLEY MOLEY DONUT COMPANY IS A HOLEY-OWNED SUBSIDIARY."

THE HOLEY MOLEY  
DONUT COMPANY  
IS A HOLEY-OWNED  
SUBSIDIARY.

*Center Justification*

A dark gray rectangular box containing white text. The text is stretched to fill the width of the box. The text reads: "THE HOLEY MOLEY DONUT COMPANY IS A HOLEY-OWNED SUBSIDIARY."

THE HOLEY MOLEY  
DONUT COMPANY  
IS A HOLEY-OWNED  
SUBSIDIARY.

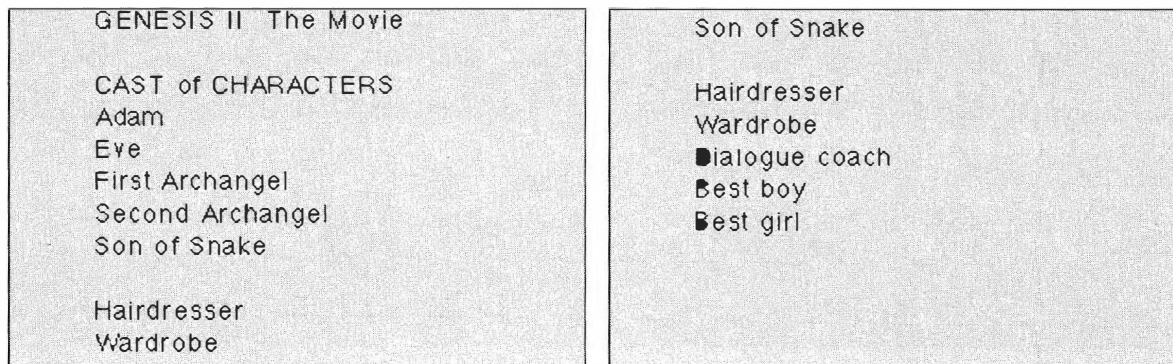
*Filled Justification*

**TIP** *To use multiple lines of filled justification, put carriage returns at the end of each line rather than letting Animator wrap the text. Otherwise, it will squeeze everything on one line.*

### ***Scrolling Text***

In the next exercise, you'll scroll the credits for a flic up and off the screen. The default options are fine: the text will scroll up, pixel by pixel, left-justified.

The file shown in the illustration is IN06SCRL.TXT on the IN DISK. It's ready for you to cast the main parts. If you don't have this file, you can quickly make up your own. Select NEW TEXT on the titling panel and enter the twelve lines of text for the cast of characters, interspersing two blank lines as illustrated. Be sure you don't add any extra blank lines at the end.



***Cast of Characters***

You'll need to enlarge the editing box so that it is the height of the entire screen (200 pixels). Even so, there is more text than can fit in the editing box — it will scroll up automatically during the animation. When you click on the frame count box, the number of frames recommended for this scrolling will be 252. Half that number will do pretty well and take much less time to render.

---

## Scrolling the Credits

Type **fry**

Type **at** Displays titling panel.



Load the IN06SCRL.TXT file.



Select NEW TEXT and enter the text and blank lines as shown.

Click **LOAD FONT** Displays file selector set to load a font.

Scroll down in the list of fonts until **VELVET14.FNT** is in the window.

Double click **VELVET14.FNT** Loads font file VELVET14.FNT.  
So far, no text appears on screen.

Click **EDIT TEXT** Displays text in selected font.

Click **screen** Click outside editing box to resize it.

Click **screen** Set upper left corner of box when status line shows 48 0.

Click **screen** Set lower right corner of box when status line shows 272 199.

Use the text editing keys to move the cursor and type in the names of your actors and film crew, to the right of their roles.

Right click **screen** Returns you to titling panel.

Click **FRAME COUNT** Displays 252, the number of frames recommended for animation.

Click **DO TITLING** Displays time select panel.

Right click **frame control icon** Any frame control icon displays frames panel.

Create 126 frames on the frames panel.

Right click **screen** Returns you to time select panel.

Click **PREVIEW** Right click to return to time select panel when through.  
If all is well, you can render the flic and play it. If not, cancel and edit the text or resize the box before continuing.

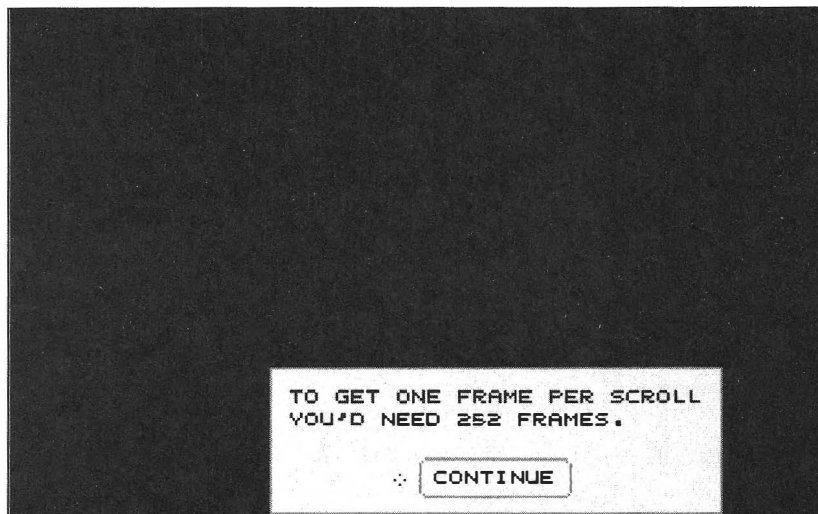
Click **RENDER**

Click **play icon** Plays animation until you right click or press a key to stop it.

---

**NOTE** *Once you leave the time select panel to create frames, do not right click on the TIME SELECT button to return to it. Doing so takes you out of the process begun when you selected DO TITLING. You'll find that PREVIEW and RENDER are grayed out (unselectable) and you'll have to go back to the titling panel and start again. Instead, right click on the screen or press the <spacebar> to return from the frames panel to the time select panel.*

As you just saw, creating half the suggested number of frames produces fairly smooth scrolling. You can create fewer frames than the number given in the frame count box and get reasonable results, provided the number is an even factor of the recommended frame count.



*Frame Count Displayed*

**TIP** *To scroll a title down from above the screen, make the top edge of the editing box the top of the screen, enter the text, and insert blank lines above it with the <enter> key so that the text is at the bottom edge of the editing box. Set the titling option to SCROLL UP and render the text with the REVERSE option on the time select panel. Since the size of the font determines the space between lines, you'll have to experiment to find the best relationship between text and blank space.*

*Similarly, to scroll text up from below the screen, make the bottom of the editing box the bottom of the screen, enter the text, and insert*

*enough blank lines above the text with the <enter> key so that no text shows in the editing box. Set the titling option to SCROLL UP and render normally.*

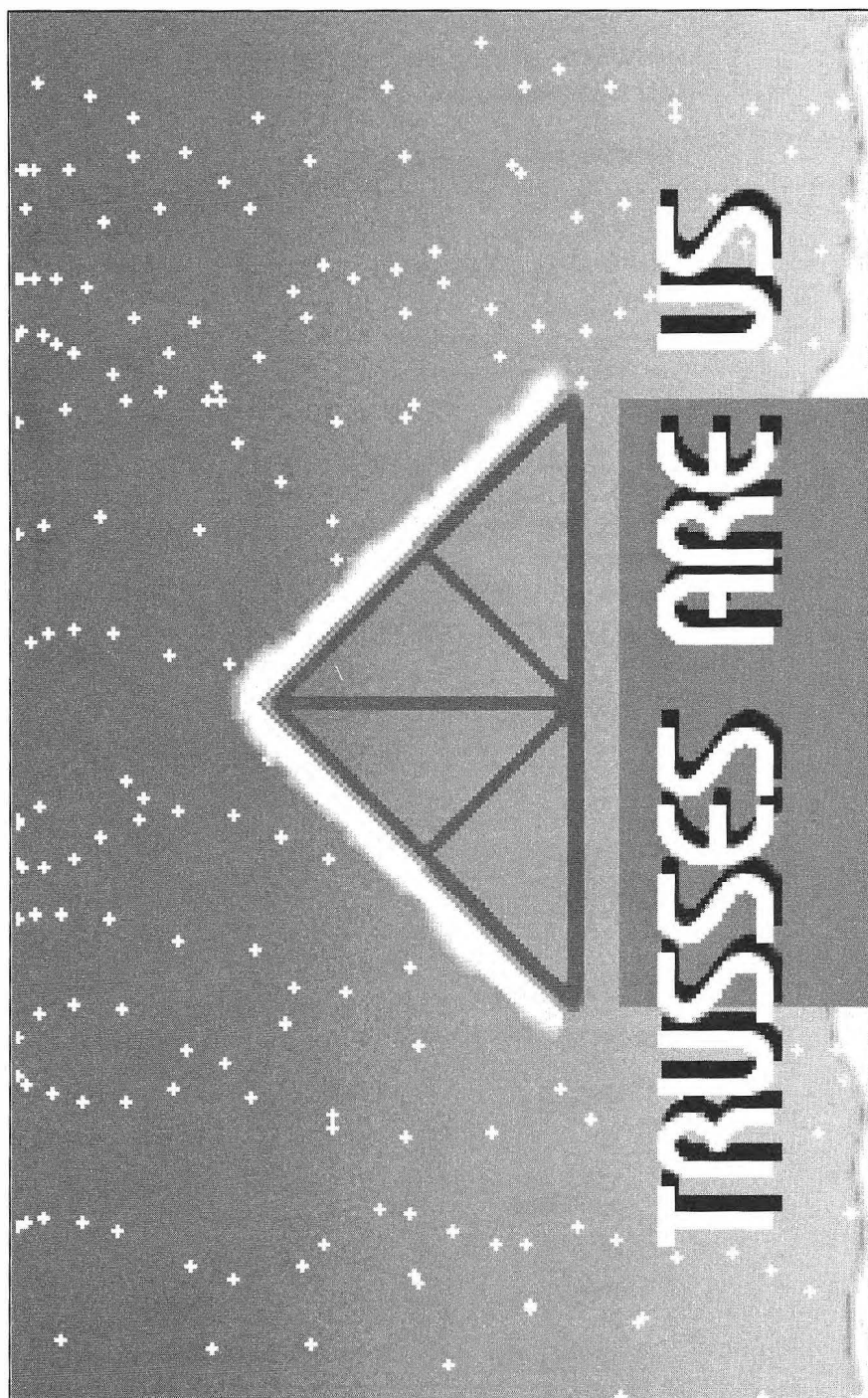
*To scroll text from right to left starting from a position off the screen, make the editing box the full width of the screen and enter the text. Use the <spacebar> (not the <enter> key) to insert enough spaces ahead of the text to force the text to the second line, so that the first line is blank.*

## Next Steps

Chapter 9 demonstrates some special titling effects you can create using text as a cel, and Chapter 13 shows you how to composite titling effects with background scenes and other moving elements.

In Chapter 7, you'll learn how to apply a title to one segment of a flic and how to make a drop shadow.





*Trusses Are Us With Snow*



# Segments Got Rhythm

A flic is a sequence of frames. A *segment* is a sequence of frames that makes up part of a flic. In other words, a segment is a flic within a flic. Segments are analogous to chapters of a book; their content and visual style relate closely to the larger structure and contribute sequentially to the total effect.

Each segment is a temporal grouping of frames within the flic. The *pacing*, or overall tempo of the flic, results from the contrasts between short and long segments and fast and slow movements. Each segment has its own *timing* — its internal structure — which produces that segment's rhythm. Much of the art in animation is integrally bound up with pacing and timing.

Designating a portion of a flic as a segment lets you work on it in isolation from the rest of the flic. You can apply operations over time to the segment without affecting other frames. This is how to make optical effects start and end on certain frames, change colors, do titles and metamorphoses, process images, and perform any other operations you want to apply solely to a sequence.

Once you've created a segment, you can play it back by itself, checking the effect. In a large, complex flic, it's valuable to be able to concentrate on one sequence at a time. You can more easily keep track of what is happening and make adjustments.

This chapter introduces the basic techniques for creating and refining segments in Animator. The exercises take you through the steps of making a three-segment flic. The example is an ID for a fictional construction company. Like other examples in this book, the ID is purposely kept simple; nevertheless, you may want to declare a break at various points indicated along the way.

You'll also create a grid and a mask in this chapter, and you'll see how to put a drop shadow on text. Suggestions for going further with the flic are at the end of the chapter. Although no files from earlier chapters are needed to do the exercises, it's assumed you already know the basics covered in Chapters 1 through 6.

## Analyzing Movements for a Flic

Before creating segments for a flic, you should have a sense of the whole. A storyboard is an excellent aid at the outset. As you saw in Chapter 2, a storyboard helps determine the spatial requirements of a flic which you can then test in a layout. Similarly, a storyboard helps establish where important moments occur so you can decide where segments should begin and end. By analyzing the relationship of each segment to the flic as a whole, you can consider pacing and timing, length, play speed, and other temporal factors.

No matter how extensively you plan, you'll likely make manual adjustments until the flic is close to what you had in mind. Until you have a rough version to work on, you often can't tell whether a segment ought to speed up, slow down, increase by three times as many frames, or start slowly and pause in the middle.

In the exercises that follow, you'll create these segments:

- Segment A, in which the pieces or *members* of a roof truss are assembled.
- Segment B, the *pullback*, in which the constructed roof truss moves back along the Z axis.
- Segment C, in which a second moving element appears, forming an abstract design of a building.

In the process, it will be necessary to fiddle with individual frames to overcome some of the limits of automated design. Ultimately, you'll depend on your own artistic hand and eye to apply Animator tools and inks for the most polished results.

## Setting Up Frames for a Segment

You can adopt either of two strategies for creating segments. One is to estimate the total number of frames for the flic and set them, later inserting or deleting frames as needed. The alternative is to build the flic a segment at a time, adding frames for the next segment, and so on until you reach the total number of frames for the flic. Which way you choose to work is really a matter of style.

This chapter employs the first strategy. Working from a rough estimate, you'll create frames for the flic and modify the total number when the pacing and timing seem to warrant it. At times, there will be extra blank frames at the end, but you can avoid playing them by playing back only the segment you're working on.

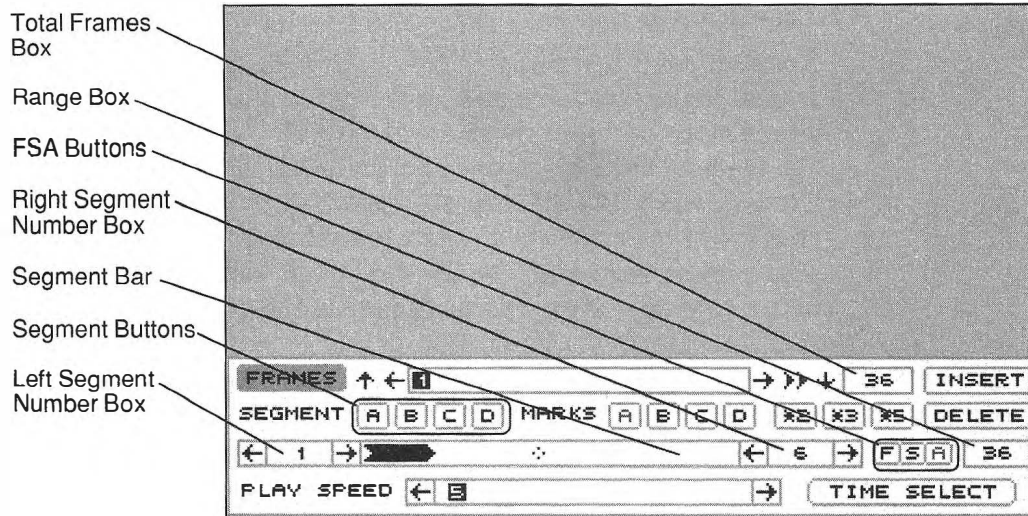
### *Setting the Segment Bar*

To create a segment, you set the first and last frame on the segment bar, which is the long bar in three sections located in the middle of the frames panel. To move the slider on the segment bar, you can drag it with the mouse or click on the arrows. The various movements are listed in the following table.

Setting the Segment Bar		
<i>Location</i>	<i>Action</i>	<i>Result</i>
Left segment number box	Click left-most left arrow	Moves first frame back one
Left segment number box	Click left-most right arrow	Moves first frame ahead one
Left segment number box	Click left-most number	Moves first frame to one displayed
Slider	Drag to left	Moves first frame and last frame back together
Slider	Drag to right	Moves first and last frame forward together
Slider	Right drag left end	Sets first frame
Slider	Right drag right end	Sets last frame
Segment bar	Click left of slider	Moves back one segment
Segment bar	Click right of slider	Moves ahead one segment
Right segment number box	Click right-most left arrow	Moves last frame back one
Right segment number box	Click right-most right arrow	Moves last frame ahead one
Right segment number box	Click right-most number	Moves last frame to one displayed

**NOTE** *The slider appears as a box for a segment consisting of a single frame and as an arrow for two or more frames. To right drag, hold down the right mouse button while dragging the slider in either direction. While right dragging, the arrow reverses when the last frame of the segment is a lower number than the first frame, as displayed in the left and right segment number boxes.*

Because the same background color is used in all the segments, you'll first change the key color before creating additional frames. Next, you'll set 36 frames for the flic, based on an estimate of six frames to construct the truss in the first segment and ten frames for each of the other three segments. Then you'll set the first six frames as the first segment.



*First Segment Set on Frames Panel*

## Setting a Segment

Type <b>fry</b>	Resets program.
Right click <b>cluster</b>	Displays palette panel.
Right click <b>matrix slot 1</b>	Readies default key color in register 0 for a change.
Click <b>mini-palette</b>	Select light blue for the key color.
Return to home panel.	
Right click <b>frame control icon</b>	Displays frames panel.
Right click <b>total frames box</b>	Enter 36 frames for flic and return to frames panel.
Right drag <b>segment slider</b>	Set right end of segment slider to 6.

You've designated the first six frames of the flic as the first segment. Because the default setting of the number box to the left of the segment slider is 1, the left end of the segment slider was already set correctly.

**TIP** If you find it clumsy in long flics to drag the slider to the correct frame, drag the slider near where you want it and click on the left or right arrow to move the slider one frame at a time. You can also hold down the button on an arrow to quickly move the slider by several frames.

### ***Frame Mode Buttons and Segment Buttons***

You can control whether actions are applied solely to the current frame, the current segment, or the entire flic by selecting one of the *frame mode* buttons. These are the [F] [S] [A] buttons to the right of the segment bar. They stand for frame, segment, and all, respectively. Turning on the [F] button lets you work on one frame at a time. When the [S] button is turned on, operations that occur over time affect only the current segment. The [A] button in this series is the default setting; when it is on, operations are applied to all the frames in the flic.

The *segment buttons* [A] [B] [C] [D] are above the segment bar. These buttons are set by default to segments of ten frames each. Clicking on one of the segment buttons will make whichever segment is assigned to that button the current segment. You can temporarily save your current segment to one of these segment buttons by right clicking, which assigns the setting to the button. When the current segment is assigned to a segment button, its button is highlighted. These settings are not saved with the flic, but can be saved in a settings (SET) file.

In the next exercise, you'll turn on the [S] frame mode button to restrict actions to the current segment, and then assign the first six frames to the [A] segment button.

---

### **Selecting Frame Mode and Segment Buttons**

<i>Click</i> [S]	Selects segment as frame mode.
<i>Right click</i> [A] <b>segment button</b>	Assigns frames 1-6 and highlights segment button.

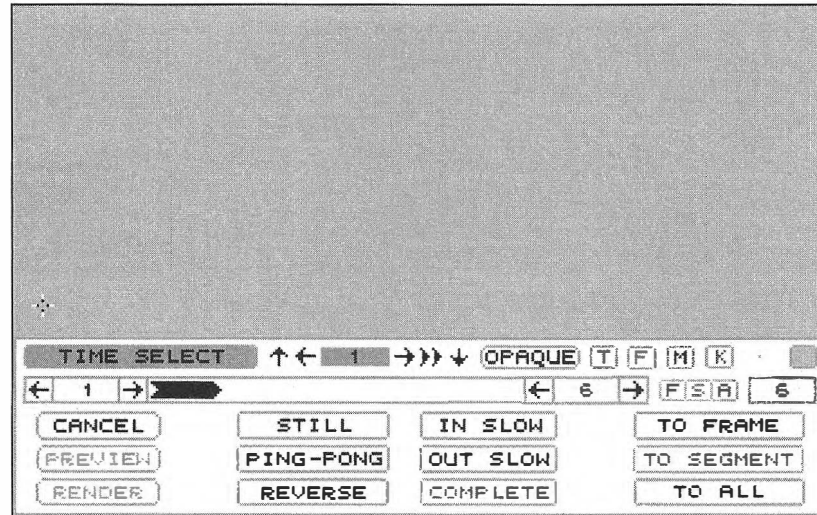
Return to home panel.

---

**TIP** *Make sure you right click to assign a segment to a segment button. It's easy to left click instead without realizing that the segment has not been assigned.*

The segment bar and the [F] [S] [A] buttons also appear on the optics panel and on the time select panel. These buttons are convenient for checking and changing the segment settings before or after a preview.

The time select panel also shows three buttons — TO FRAME, TO SEGMENT, and TO ALL — that perform the same function as the [F] [S] [A] buttons. You can set them instead.



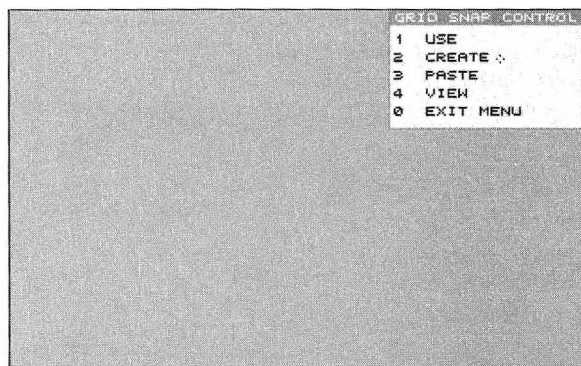
*First Segment Set on Time Select Panel*

## Creating a Grid

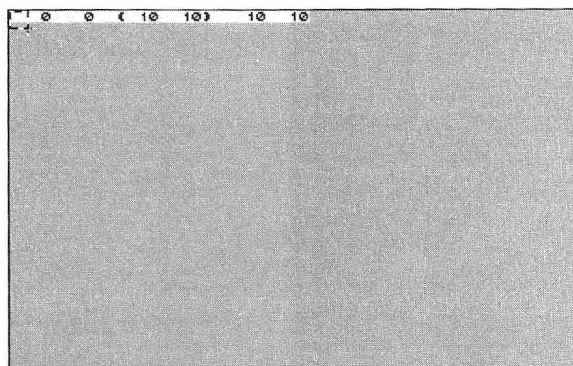
A grid helps you design the truss symmetrically and center it on screen. Although the pullback in the second segment will be automatic, Animator has no automatic way to center the truss before such a movement, as in some animation systems. Later, you'll use the grid again to align the second moving element and to place the text.

In Chapter 3, you used the default grid, which is 8 pixels by 8 pixels, to place elements on a chart. For this flic, you'll create a grid that is 10 pixels by 10 pixels.

To create a grid, you set two diagonal corners of the unit cell much the way you use the box tool. The first set of numbers on the status line indicates the location of the first corner. The last set indicates the second corner. The numbers in parentheses show the offset or spacing between points and, unlike the box tool, do not include both start and end points.



*Selecting CREATE on GRID Submenu*



*Creating a 10 x 10 Grid*

---

## Creating a Grid

Open **EXTRA** Select **GRID**

Select **CREATE**

Click **screen**

Move cursor Click **screen**

Right click **screen** twice

Set first corner of grid when status line reads 0 0.

Set second corner of grid to (10 10) on status line.

Returns to GRID submenu, then to home panel.

---

As soon as you finish creating the grid, USE is automatically selected, turning on grid snap. But unless you paste the grid to the screen, it isn't visible. Actually, you wouldn't see the grid now even if it were pasted, because the current color is the same as the background color.

## Creating a Write On

The motion sequence in segment A is a *write on* — an animation technique in which individual parts of an object or characters of text appear frame by frame and seem to fall into their rightful places. In the next few exercises, you'll create members of a roof truss which appear to assemble themselves. The truss is simple enough that you could draw it frame by frame fairly easily, copying each frame to the next and adding the next member to it. However, many write ons are



complex enough that it is easier to work backwards, drawing the entire finished figure first and then erasing elements frame by frame until you end up with a blank frame. This is the technique you'll use to create the write on of the truss.

You'll prepare the last frame first, and step back through the segment, removing members until the first frame is blank. Then, when the segment is played, the members will come together to form the truss, creating the illusion that the truss is being built while you watch. Erasing the internal web members will be easier if you use a mask to protect the outer chords from erasure.

### ***Working With a Mask***

While drawing the truss, you'll create a *mask*, an area of the screen impervious to ink. When a mask is in effect, the portion of the screen it covers cannot be drawn on or inked. Masking part of the truss will enable you to add and remove members cleanly. Experienced animators rely on masking to keep from overrunning the edges of an object, to isolate objects so they can be picked up as cels, and to produce special effects and illusions.

To open the MASK submenu, either right click on the [M] button or select MASK from the EXTRA menu.

In Animator, you can make a mask or clip one. You make a mask by selecting CREATE on the MASK submenu and drawing, filling an outline, scraping an area, or however you create it. You can clip an existing image as a mask by selecting CLIP. Clipping creates a mask of everything on screen that isn't in the key color. When you create or clip a mask, it is stored in the *mask buffer* and can be saved as an MSK file.

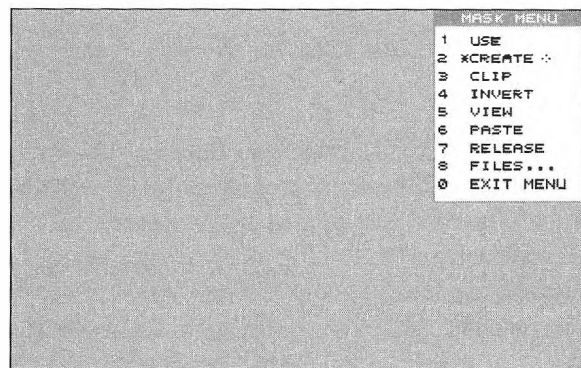
If a mask is in the mask buffer, clicking on the [M] button toggles it on and off. Selecting VIEW shows what is currently in the mask buffer first for a moment in gray, then in the current color. Selecting USE or turning on the [M] button ends CREATE (if it was selected) and puts the mask into effect. The [M] button also appears on the time select panel and on the optics panel. Use it to toggle a mask on and off, or use the MASK submenu before rendering frames or while working on an optics move.

**TIP** When you view a mask, it briefly flashes in gray, and then is displayed in the current color. Before viewing the mask, change the current color to one that isn't used in the drawing so you can easily distinguish the mask. It's a good idea to designate one unique color for masks.

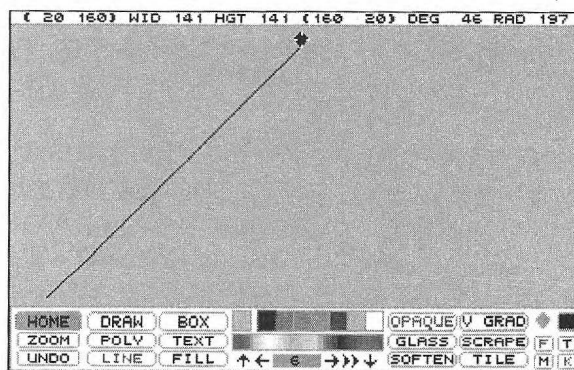
The MASK submenu tells you that CREATE is turned on by putting an asterisk beside it. When the [M] button is highlighted in other menus, you know that USE is on and, therefore, have to conclude that CREATE must be off.

### ***Drawing the Chords and Creating a Mask***

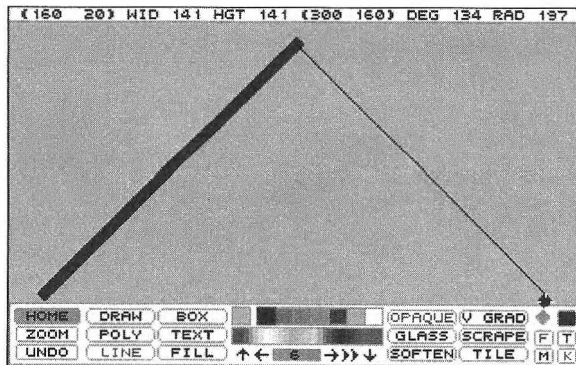
The easiest way to create the mask is at the same time you draw the outer members of the truss, its two *top chords* and its *bottom chord*. When CREATE is on, everything you draw also becomes the mask. In the next exercise you'll turn on CREATE on the MASK submenu and use the line tool with a big brush to draw the truss chords on frame 6, the end of the segment. Although you can't see the grid, grid snap will help make your points accurate. After drawing the chords, you'll save the mask and the current settings in mask and settings files.



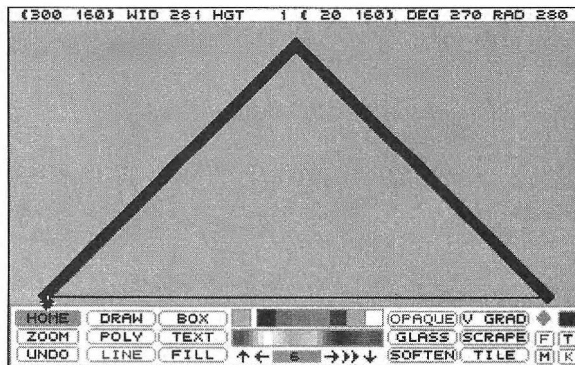
CREATE Selected on MASK Submenu



Drawing the First Line



*Drawing the Second Line*



*Drawing the Third Line*

## Drawing the Chords and Creating the Mask

*Right click* **SPRAY**  
*Click* **tools window**

Displays drawing tools panel.  
*Select* line tool to replace spray tool.

Return to home panel.

*Click* **mini-palette**  
*Click* **frame control icon**  
*Right click* **brush**

*Select* dark blue as the current color.  
*Click* right arrow five times to start at end of segment, frame 6.  
*Set* brush slider to 8 and return to home panel.

*Open* **EXTRA Select MASK**  
*Select* **CREATE**  
*Right click* **screen**

Displays MASK submenu.  
An asterisk appears beside CREATE to indicate it is turned on.  
Closes MASK submenu and returns you to home panel.

*Use* **LINE**

*Draw* line from just above HOME, (20 160) on status line, to (160 20).

*Use* **LINE**

*Draw* second line from (160 20) to (300 160).

*Use* **LINE**

*Draw* third line from (300 20) to (20 160).

*Click* **[M]**

Turns on USE, ending CREATE.

*Right click* **[M]**  
*Click* **VIEW**

Displays MASK submenu.  
Briefly displays mask in gray so you can check it, before displaying it in the current dark blue.

Right click screen. Return to MASK submenu.

**Click Files** Displays files panel for masks.

Save the mask as TRUSS.MSK.

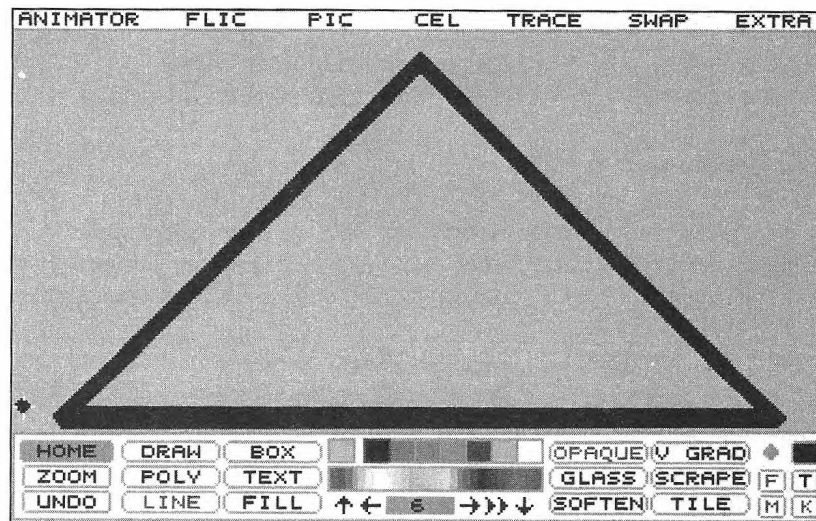
**Click SETTINGS** Sets file selector to save settings.

**Click [+]** Saves the current settings as TRUSS01.SET.

Right click until you return to home panel.

---

As you can see, the triangle is horizontally centered on screen. It is 140 pixels high, exactly one-half of its full width of 280 pixels. There are 20 pixels on either side of it. It isn't quite centered vertically; there are 20 pixels above it and 40 below it (200-160).



*The Chord Completed*

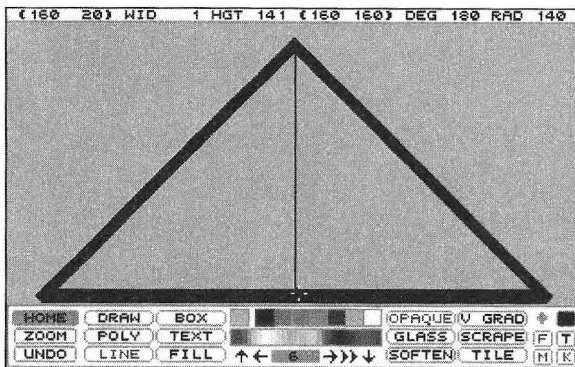
Anything you draw while CREATE is turned on is part of the mask. Therefore, the three lines are now both drawn on screen and masked. If you draw something while CREATE is on that you don't want to be part of the mask, you can't undo it. It will disappear from screen but remain in the mask buffer. To clear out the mask buffer entirely, select RELEASE on the MASK submenu. An alternative is to paste the

mask to a blank frame, correct it, and select CLIP on the MASK submenu to substitute the updated mask.

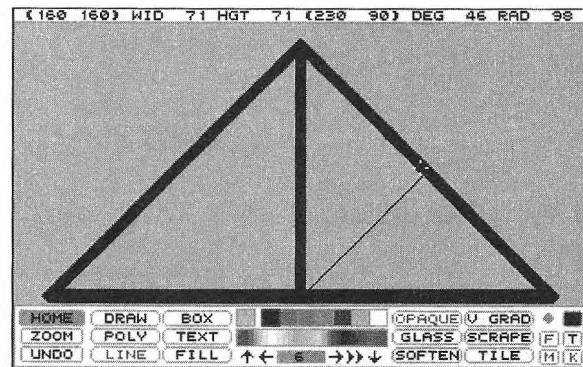
**NOTE** *The segment settings on the frames panel, including the segment button setting, are not saved with the flic; they are only saved in a settings file.*

### ***Drawing the Truss Web***

In the next exercise, you'll draw the inner pieces or *web* of the truss. Whether the mask is on or off doesn't matter while you draw these lines because they're the same color as the outer chords. However, the mask will be essential in the subsequent exercises, where these lines will be removed, frame by frame. After drawing the lines, save the flic.



*Drawing a Vertical Member*



*Drawing a Diagonal Member*

### **Drawing the Truss Web and Saving the Flic**

Set brush slider to 6.

Use **LINE**

*Draw* vertical line from (160 20) to (160 160).

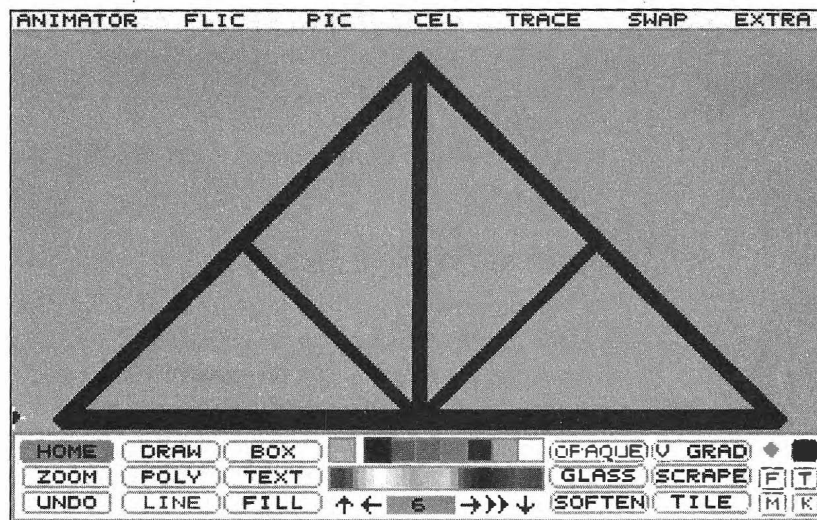
Use **LINE**

*Draw* diagonal line from (160 160) to (230 90).

Use **LINE**

*Draw* diagonal line from (160 160) to (90 90).

Save the flic as TRUSS01.FLI.

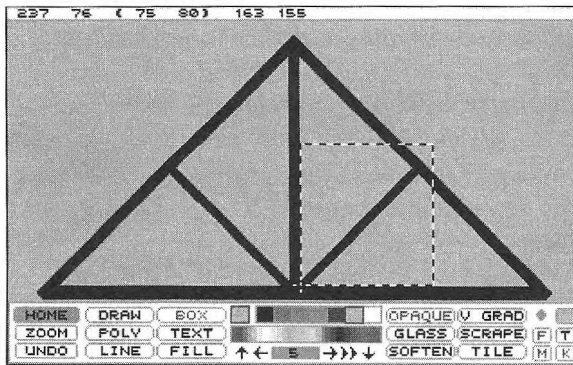


*Frame 6 Completed*

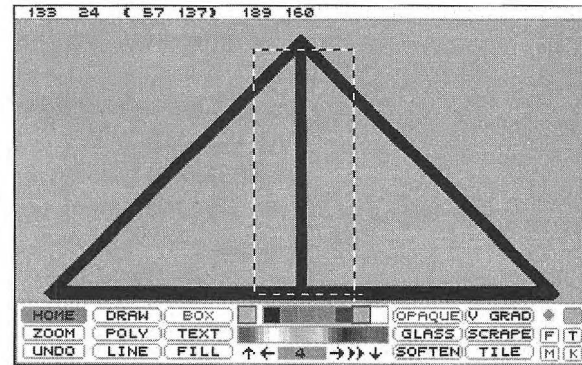
If you'd like to take a break now, you can later return to where you left off by loading the flic file, the mask file, and the settings file.

## Using the Mask

Next, you'll create the rest of the frames of the write on, working backwards from frame 6 to frame 1, which you'll leave blank. First, you'll view the mask to check it. Then, you'll use the box tool to erase the diagonal webs, applying the key color as an eraser. Because the mask is on, it prevents ink from being applied to the outer members. This removes the web without erasing any part of the chords, even where the box overlaps them. In removing the diagonal web members, place the box carefully so it does not overlap part of the vertical web member, which is not masked.



Removing a Diagonal Web



Removing the Vertical Web

## Disassembling the Truss Web

Continue from previous exercise or load TRUSS01.FLI, TRUSS.MSK, and TRUSS01.SET.  
Make sure the [M] button is turned on, and frame 6 is the current frame.

**Click key color** Select key color as the current color.  
**Open SWAP Select CLIP**  
**Click frame control icon** Click left arrow to move back to frame 5.  
**Open SWAP Select PASTE**

Turn off GRID USE.

**Click BOX** Draw rectangle encompassing right diagonal web member.  
**Use BOX** Draw rectangle encompassing left diagonal web member.  
The two diagonal web members should no longer show.

Clip new image to swap screen, move to frame 4, and paste image from swap screen.

**Use BOX** Draw rectangle encompassing vertical web member.  
Now the vertical web member is gone.

Clip new image to swap screen, move to frame 3 and paste image from swap screen.

Notice that the mask did not affect the image pasted from the swap screen. However, if you had tried to use CEL CLIP and CEL PASTE, the chords would have been masked and would not have been pasted.

Now that the web members are gone, you can remove the truss chords, one at a time. You'll turn the mask off, turn grid snap back on and erase the chords by drawing over them with the line tool. You'll use a size 8 brush again, with the key color still selected.

---

### **Disassembling the Truss Chords**

Turn on GRID USE and make sure the brush is set to size 8.

<i>Click</i> <b>LINE</b>	<i>Draw</i> line from (20 160) to (300 160). Nothing happened! You haven't turned off the mask.
--------------------------	----------------------------------------------------------------------------------------------------

<i>Click</i> <b>[M]</b>	Toggles mask off when it's on.
<i>Use</i> <b>LINE</b>	<i>Draw</i> line from (20 160) to (300 160).

Clip new image to swap screen, move to frame 2 and paste image from swap screen.

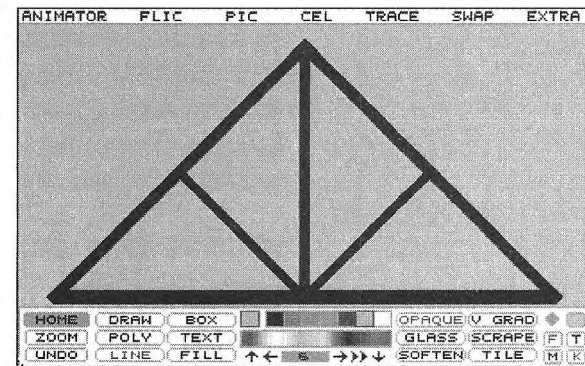
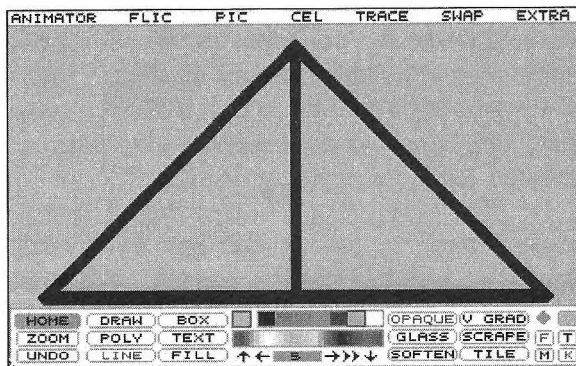
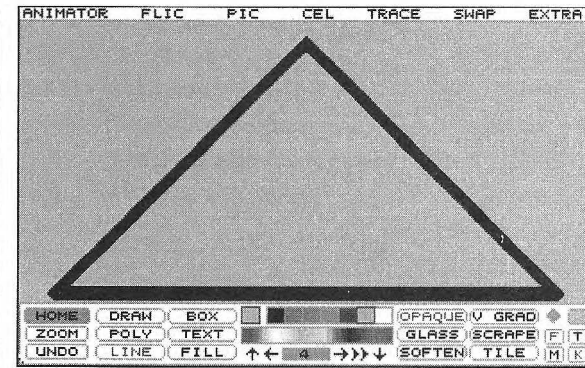
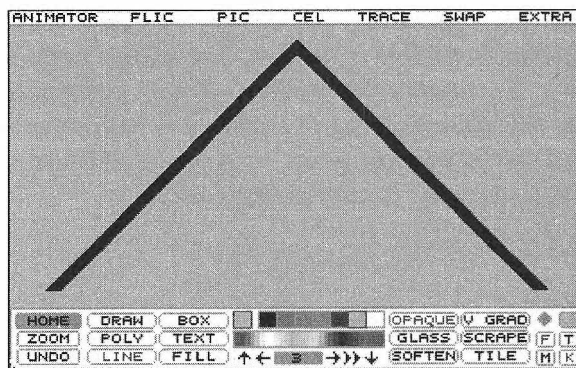
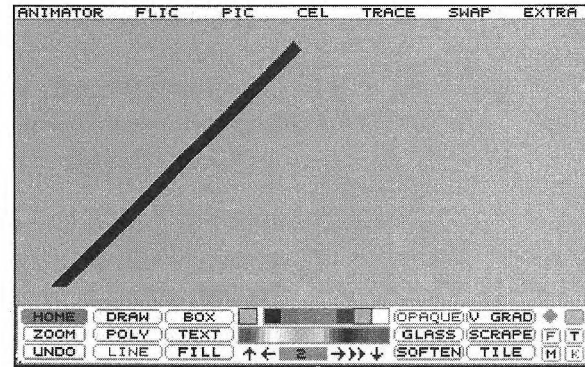
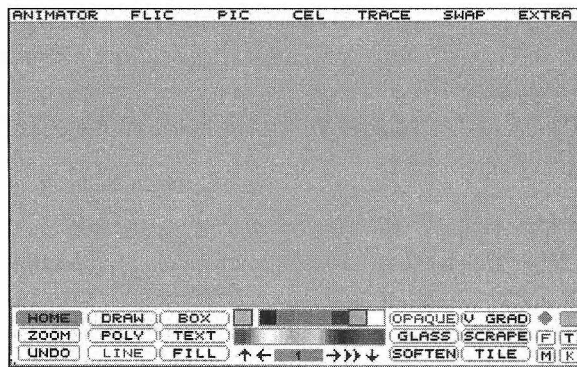
<i>Use</i> <b>LINE</b>	<i>Draw</i> line from (300 160) to (160 20).
------------------------	----------------------------------------------

Play the flic.  
Save it as TRUSS02.FLI and the settings as TRUSS02.SET

---

The write on works. When played, the truss is built frame by frame, with the last two web members appearing simultaneously.





*Assembling the Truss Frame by Frame*

**TIP** *An alternative to starting on frame 6 and working backwards would be to draw the complete truss on frame 1 and remove members on each succeeding frame, leaving a blank frame as the last one in the segment. Then you'd select BACKWARDS on the FLIC menu to save the frames of the flic in reverse order. The result would be the same, but you wouldn't be able to play the flic until you saved it.*

When you play the flic, the frames go by too quickly. In the next section, you'll see how to alter the timing to improve the pace. Because the animation is only six frames out of a total of 36 frames, playing the flic through means watching quite a bit of blankness until the truss comes round again. You could stop the playback after the segment plays but, as you'll soon see, Animator has better alternatives that let you play back the segment by itself.

**MORE** *The truss was drawn as simply as possible. To make a more impressive flic, you could use the edgetool to outline it or add a texture by masking the entire image, inverting the mask, and applying image processing effects and different inks. If you were going to make such refinements to the images, you would do so at this point, before any duplicate frames are inserted into this segment to change the pace.*

## Pacing and Timing

Getting the pace right is crucial to a flic's effect. One flic may call for a sedate series of movements, while another makes its point by keeping the viewer slightly off balance. An educational flic that graphically explains the liquefaction of ground fill demands a different pace than a promo for MTV.

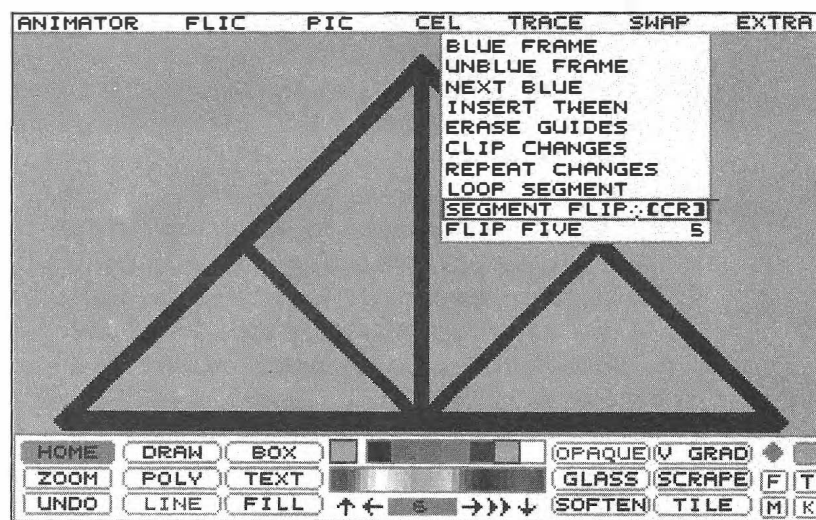
The timing of segments complements and sparks the pacing. A movement that is too slow seems to drag, while one that zips past is only desirable if you're aiming for a blur. Yet too much of the same is dull. *Holding* a frame for a longer period on screen produces pauses and syncopations of movement for more exciting timing.

Animator gives you several ways to adjust the speed at which movement occurs and to insert holds. For fine control over a few frames, you can insert or delete one frame at a time. To increase or decrease the speed of the flic, you can set the *play speed* or multiply the overall number of frames.

Playing a flic at varying speed settings lets you quickly see the effect of faster or slower movement, without altering the flic. In contrast, if you insert frames and decide later you don't want them, you either have to delete them, which is tedious, or go back to an earlier version of the flic.

**NOTE** *Classic animation techniques allow for subtle manual adjustments to coordinate action with sound, based on the standard timing of 24 frames per second for film or 30 frames per second for videotape. Often, the sound elements are planned and recorded first, and frames are added so that images appear on time. That's how the crashing sounds are matched to the catastrophic path of Wile E. Coyote's Acme Supplies truck and the "beep-beep" of the Road Runner is heard at exactly the right instant after the dust settles. The hippos in Fantasia pirouette to Tchaikovsky's beat, not vice versa. There is no facility within Animator for coordinating frames to music. Animator's speed varies according to the hardware on which an animation is shown. What you can do to add music to presentations running on the computer or to flics you transfer to videotape is discussed in the appendixes.*

Ultimately, you'll have to experiment with adjusting the pace and timing. Adjusting the play speed uses fewer frames than does inserting frames. That means a smaller flic file but less flexibility in making final adjustments. The play speed setting determines the pace of the entire flic; it cannot be set differently for individual segments. However, in Chapter 14 you'll see how to use scripts and the Player utility to play several flics in a continuous series, each with its own speed setting.



SEGMENT FLIP Selected on TRACE Menu

While adjusting the timing, you can play just the current segment with LOOP SEGMENT or SEGMENT FLIP. Both are on the TRACE menu. LOOP SEGMENT plays the segment through continuously, until you stop it by pressing any key or the right mouse button. SEGMENT FLIP plays the segment through only once. The <enter> key is the convenient keyboard shortcut for segment flip. Both LOOP SEGMENT and SEGMENT FLIP always return to the current frame.

## Changing Play Speed

The easiest way to adjust the pace is to set the *play speed bar*, which is at the bottom of the frames panel. The minimum setting is zero, the top speed setting is 120, and the default setting is 5. The higher the setting, the slower the play back speed.

In the following exercise, you'll adjust the play speed to see the effect of slower and faster movement, and you'll play the segment back. On the frames panel, the [S] button (from the [F] [S] [A] series) should still be highlighted as well as the [A] segment button, and the segment slider set for frames 1 through 6.

---

## Changing Play Speed

Continue from previous exercise or reload TRUSS02.FLI, TRUSS.MSK, and TRUSS02.SET.

Right click frame control icon

Drag play speed slider

Set play speed to 20.

Return to home panel.

Open TRACE Select SEGMENT FLIP

The segment plays through once, at a much slower speed than previously.

Press <enter>

Plays segment through again via keyboard shortcut.

Display frames panel again, set play speed to zero, and return to home panel.

Press <enter>

Plays segment through again, very quickly.

---

Setting the play speed to 20 is better for seeing the write on; the zero setting is much too fast. You could continue to experiment with different settings and perhaps happen on one that seems just right for your computer. But a setting that works for the write on may not be appropriate for the other segments in this flic. You can play different segments at different speeds with SEGMENT LOOP, but when the entire flic is played it will use only the current speed setting. Therefore, you're better off using a speed of zero as a base upon which to add frames, and adjusting the number of frames to refine the speed and pacing.

**NOTE** *The Autodesk Animator Reference Manual advises that the pause at each successive speed setting increases 1 / 70th of a second (a jiffy), but that actual playback speed varies with the amount of graphic information to be processed for a frame. When you consider this variance together with the variance for the hardware capabilities of different systems, it becomes highly iffy to depend on the jiffy (an old Southern saying).*

## Inserting and Deleting Frames

For the most subtle changes in timing, you can insert frames one by one and play the segment after each addition. If you go too far, you can delete frames one by one to return to the optimal timing. The insert button is to the right of the total frames box on the frames panel; the delete button is below the insert button.

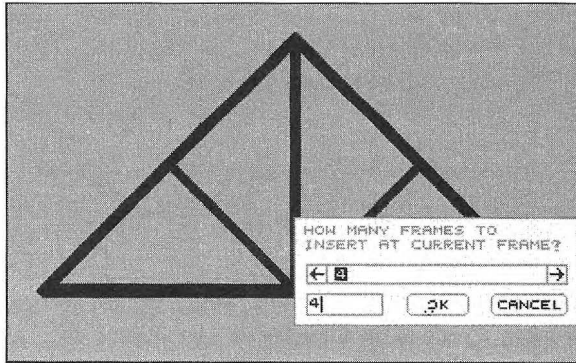
Clicking on INSERT adds one duplicate frame immediately following the current frame. For example, in a flic of 36 frames, inserting one frame while frame 6 is displayed adds a new frame 7 (which is a copy of frame 6), while the former frame 7 becomes frame 8, and so on to frame 36, which becomes frame 37. Clicking on DELETE removes the current frame and renumbers all subsequent frames in the flic to reflect the decrease.

You can insert more than one copy of a particular frame or delete a specified number of frames by right clicking on INSERT or DELETE. A dialogue box similar to the total frames dialogue box is displayed. You can then set the slider or enter the number of frames to be added or deleted. If, for example, you insert four frames at frame 6, they become frames 7, 8, 9, and 10 while the former frame 7 becomes frame 11. All four inserted frames are copies of frame 6.

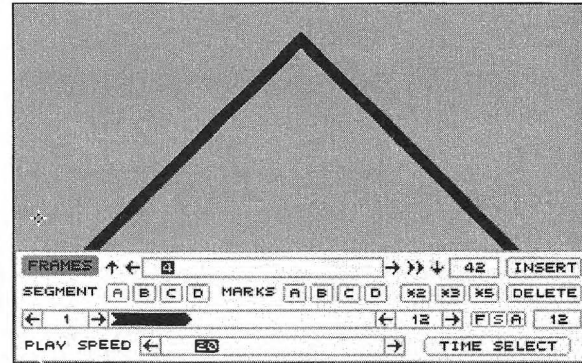
**NOTE** *Don't be misled by the fact that the number of frames in the range box and the setting on the segment bar stay the same after you insert or delete frames in a segment. Added frames show up only in the total frames box, which is to the right of the frame slider bar.*

### ***Inserting Four Frames***

In the next exercise, you'll insert four copies of frame 6 to create a *hold* at the end of the segment. That is, extra duplicates of frame 6 will appear to hold the completed truss on screen.



Inserting Four Frames



Frames Panel After Resetting Segment A

## Inserting Frames

Continue from previous exercise or reload TRUSS02.FLI, TRUSS.MSK, and TRUSS02.SET.

- Right click frame control icon** Displays frames panel.
- Drag frame slider** Set current frame to 6 with slider bar.
- Right click INSERT** Displays dialogue box for setting number of frames to insert. Enter 4 and return to frames panel.
- Click play icon** Stop flic when you're ready.

Reset play speed to 20 and play flic again, stopping it when you've seen enough.

With the faster speed setting, the hold went by too fast to judge, but the play speed of 20 provided a quick impression of the hold's length relative to the rest of the segment.

Notice that the number in the total frames box increased by four (to 40), but the segment bar and the number in the range box are unchanged. The frames added right after the first segment aren't included unless you adjust the segment length.

### *Inserting Two More Frames*

Next, you'll add a brief pause after the chord is assembled and reset the segment bar to reflect all the additions to the first segment. Then you'll use LOOP SEGMENT to play the segment through.

---

### Inserting More Frames

**Drag frame slider**                      *Set current frame to 4.*

**Click INSERT twice**                      *Inserts two frames after frame 4 (total frames box shows 42).*

**Right drag segment slider** *Drag right side of slider to set end of segment at frame 12.*

**Right click [A] segment button**      *Resets [A] segment button to new number of frames.*

Return to home panel.

**Open TRACE Select LOOP SEGMENT**      *Plays first segment only. Right click to stop it.*

---

The movement is slightly syncopated as the image of the truss chord is held on the screen for an additional two frames before the web is added.

### Inserting Multiple Copies

Animator makes it possible to adjust the speed of a flic by inserting multiple copies of every frame. The [\*2], [\*3], and [\*5] buttons to the left of the delete button on the frames panel insert two, three, and five copies of each frame, respectively. However, there is no comparable way to delete such inserted frames all at once, nor is there a way to insert multiple copies of only the frames in a segment.

**TIP** *If you know at the outset that a particular segment requires much trial and error with multiple copies, create that segment first and add on frames for other segments later. That way, you won't keep multiplying blank frames, some of which you'll likely delete later.*

In the next exercise, you'll multiply the number of frames in the flic in order to slow down the first segment, as well as the rest of the flic.



You'll learn how to jump to a specific frame in a flic, and how to delete the extra blank frames at the end of the flic.

---

## Inserting Multiple Copies

Display frames panel.

<i>Click</i> [ <b>*3</b> ]	Triples total number of frames. Total frames box shows 126.
<i>Drag play speed slider</i>	<i>Reset</i> play speed to zero.

Play flic from frames panel, stopping it after a few cycles.  
That's better, but the truss still needs to be a good deal slower.

<i>Click</i> [ <b>*5</b> ]	Multiplies frames by 5, for new total of 630 frames.
----------------------------	------------------------------------------------------

Play flic, then press <spacebar> to stop it after the truss so you don't sit through hundreds of blank frames.

<i>Right click frame slider</i>	<i>Enter</i> 180 to jump to last frame of truss segment.
---------------------------------	----------------------------------------------------------

<i>Click right segment number box</i>	<i>Resets</i> end of segment to current frame, frame 180.
---------------------------------------	-----------------------------------------------------------

The segment bar should now be set from frame 1 to frame 180.

<i>Right click</i> [ <b>A</b> ] <i>segment button</i>	<i>Resets</i> segment button for increased size of first segment.
-------------------------------------------------------	-------------------------------------------------------------------

<i>Click frame control icon</i>	<i>Click</i> right arrow to move to frame 181.
<i>Right click DELETE</i>	Displays dialogue box for deleting number of frames.
<i>Press &lt;escape&gt;</i>	Clears number in dialogue box.
<i>Type 350 Click OK</i>	Deletes 350 frames at end of flic.
	Total frames box should now show 280 frames.

Play flic, stopping it when you reach the blank frames.



If you take a break now, you can later return to this point by loading IN07TRUS.FLI and IN07TRUS.SET from the IN DISK.



If you take a break now, save the flic and settings as TRUSS03 so you can return to this point later.

---

As you just saw, pressing <escape> clears all the numbers from the dialogue box settings. Because the highest number you can enter via the slider is 100, you had to use the keyboard to enter the 350 frames to be deleted.

**TIP** *An alternative way to shorten a flic is to right click on the total frames box and enter a new, lower number.*

### ***Marking Frames***

You can assign up to four frames to the four mark buttons at the right of the segment buttons. To do so, right click on one of the mark buttons while the frame to be marked is displayed. In a flic with a large number of frames, this makes it easy to jump to the marked frame by clicking on its mark button.

Like the segment buttons, the mark buttons are not automatically adjusted when you add frames. If you assign frame 12 to a mark button, and then insert five frames after frame 6, the former frame 7 will be assigned to the mark button.

### ***Keeping Track of Frames***

After adding some frames here and there, deleting a few, and making multiple copies overall, you may lose track of where a segment begins and ends or which frames encompass a pause. To aid in locating and identifying frames, mark each frame with its number in the upper right-hand corner by selecting BLUE NUMBERS on the EFFECTS submenu of the FLIC menu. You can erase all the numbers at once by selecting UNBLUE FRAME from the TRACE menu when the [T] button is on. But be careful to make the blueing color one that doesn't appear in your drawing also, or that part of your drawing is erased as well. The color used for numbering the frames is the left-most slot in the mini-palette, called the *blueing color* whether or not it is blue.

These numbers are unchanged by adding or deleting frames. They show up when the flic plays and when you display the full screen. (They are hidden by the menu bar.)

**MORE** *Try selecting BLUE NUMBERS. First, change the blueing color in the mini-palette or the truss will be erased when you unblue them. After checking where the pauses fall, erase the numbers with UNBLUE FRAME.*

## Creating a Pullback

Segment B, the second segment, is a pullback. In it, the assembled truss seems to recede into the distance. The illusion is produced by shrinking the truss over the frames in the segment.

### *Setting Another Segment*

Segment B begins immediately after segment A. The original estimate for this segment was ten frames. In the following exercise, you'll try out the movement to see whether the segment needs to be longer or shorter.

---

### Setting Another Segment

Continue from previous exercise or load truss files.



Load IN07TRUS.FLI and IN07TRUS.SET.



Load TRUSS03.FLI and TRUSS03.SET.

Make sure the frames panel is displayed, with frame 181 current and the [S] button on.

<i>Click left segment number box</i>	Resets left end of segment slider to frame 181, the currently displayed frame.
<i>Right drag segment slider</i>	Reset right end of segment slider to frame 190.
<i>Right click [B] segment button</i>	Assigns new segment, frames 181 to 190, to button.

---

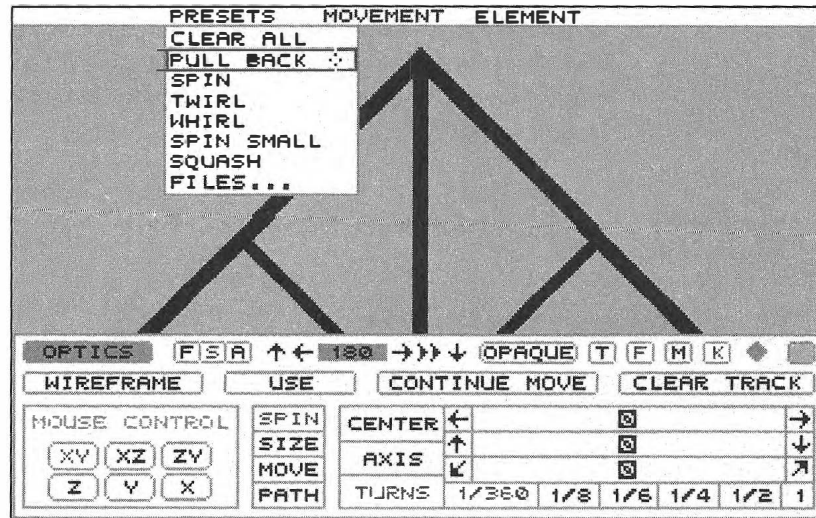
### *Moving the Truss Back*

The moving element you'll use for the optics movement is a cel of the truss. The first step is to clip a cel of the final drawing in segment A. Next, you'll clear the optics presets, a good precaution before doing any optics movement. Then, you'll select PULL BACK on the PRESETS menu of the optics menu bar to move the truss out along the Z axis.

When you click WIREFRAME, you see the movement simulated with a wireframe drawing. To see where on the Z axis the cel will appear

to end up, you'll click on **MOVE**, the third option in the middle column of the optics panel.

**NOTE** *The pullback function sets up an automatic move, moving the element the farthest possible distance back in a positive direction on the Z axis. The program determines the distance and ultimate size of the object.*



*PULL BACK Selected on Presets Menu*

---

## Creating a Pullback

**Click frame control icon** Click left arrow to move back to frame 180.

Return to home panel.

**Press <tab>** Selects CLIP on CEL menu.

**Type opc** Displays optics screen, selects CLEAR ALL on PRESETS menu.

**Open ELEMENT Select CEL** Selects cel as object of optics movements.

Make sure [S] is highlighted, so action will be applied only to the B segment.

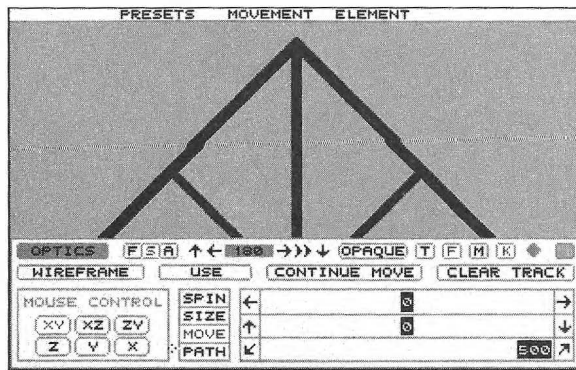
**Open PRESETS Select PULL BACK** Sets cel to move back over frames in segment.

**Click WIREFRAME** Displays wireframe rectangle representing movement of cel.

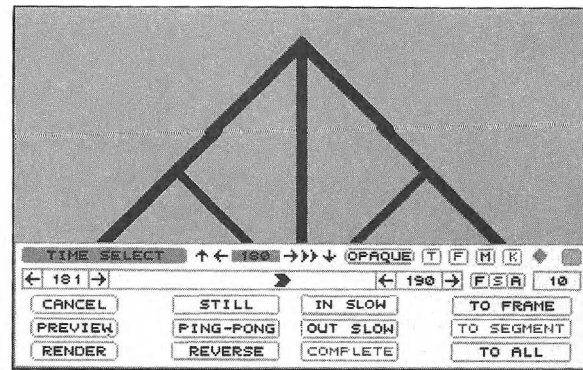
**Click MOVE** Displays X, Y, and Z axes settings for pullback, showing Z axis now set to 500.

---

The pullback, like other movements on the optics panel, is an illusion of 3D done in a 2D system. The farthest distance back on the Z axis is 500, the farthest forward is -500. A distance of 500 units makes the pulled back image half as big as the original, while negative numbers make the image grow. Another way to control the effect is to use MOVE on the optics panel, either setting the Z axis slider or moving the mouse to set the distance. You'll perform an optics movement with the mouse later in this chapter.



*Z Axis After Pullback*



*Selecting PREVIEW on Time Select Panel*

### ***Previewing and Rendering Motion***

You can now preview the pullback on the time select panel to determine whether it needs adjusting. In the next exercise you'll preview the pullback, adjust the number of frames in the segment, and render it. The approximate time for this rendering is between 2 and 12 minutes, depending on your computer.

### **Previewing and Rendering the Pullback**

- |                                       |                                     |
|---------------------------------------|-------------------------------------|
| <b>Click USE</b>                      | Displays time select panel.         |
| <b>Click PREVIEW</b>                  | It looks like you need more frames. |
| <b>Right click</b>                    | Returns to time select panel.       |
| <b>Right click frame control icon</b> | Displays frames panel.              |

Reset end of segment bar to frame 220 and reassign [B] segment button to frames 181 to 220.

Right click screen

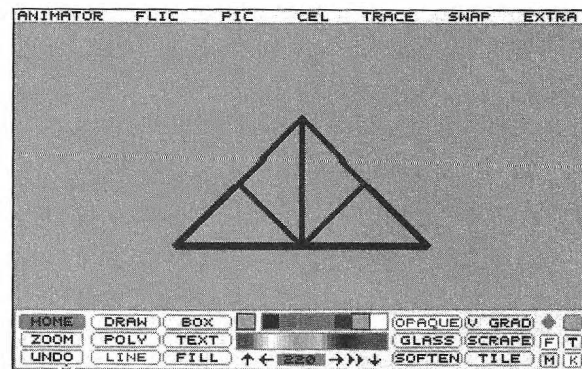
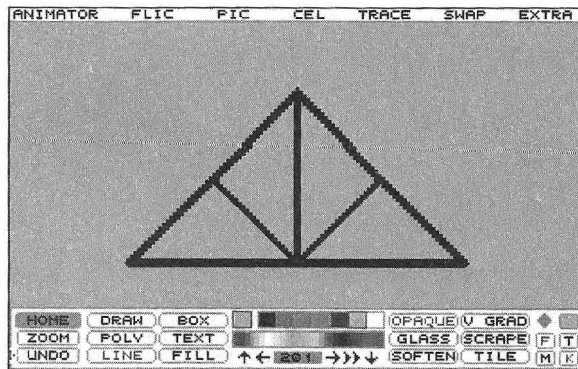
Displays time select panel again.

Click **RENDER**

Return to home panel and flip segment to view it.

Save TRUSS04.FLI and TRUSS04.SET.

---



*Truss Receding in Pullback*

## Cleaning Up Frames

During rendering, you probably noticed that the diagonal lines of the truss become more jagged as it shrinks. With a screen resolution of only 320 by 200, lines that are not vertical or horizontal are highly subject to this staircase effect, called the *jaggies*. Circles, arcs, and diagonal lines of text fonts are especially vulnerable to this effect.

In your own work, you can try to avoid images and text fonts that emphasize the jaggies. However, sometimes you have to deal with it. Suppose a client commissions a television commercial for a diamond-shaped fly swatter? Your only choice is to clean up the design, most likely by smoothing the images — that is, *anti-aliasing* them — after rendering the movement.

For the most precise results, you can zoom in and clean up each frame pixel by pixel. Cleaning up and altering frames by hand is an integral part of completing animations, even on higher-end systems.

You can ameliorate the jaggies by using unzag, Animator's anti-aliasing ink. This ink and soften ink, which is also effective in cleaning up images, were discussed in Chapter 3.

In the following exercise, you'll apply unzag ink to the truss. Depending on your computer, unzagging the forty frames of the pullback may take between 3 and 20 minutes.

---

### Unzagging the Truss

*Right click* **TILE**                      *Replace* tile ink with unzag ink and return to home panel.

*Click* **[T]**                              Turns on [T] button to apply unzag ink to multiple frames.

*Open* **PIC Select APPLY INK**      Displays time select panel because [T] button is turned on.

Make sure [S] button is highlighted so that only segment B is affected.

*Click* **RENDER**                      Unzags each frame of segment B.

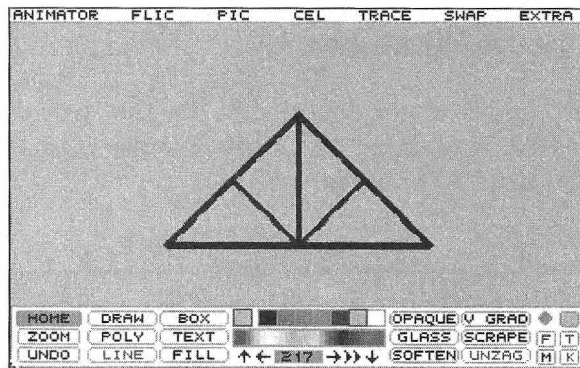
Unzag the segment again if you'd like to smooth the jaggies further.

Save the flic again under same filename, TRUSS04.FLI.

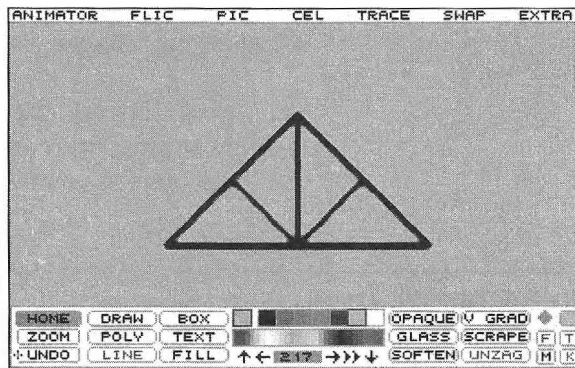
---

Unzag ink is applied over the entire segment because the [T] button is turned on. This is the most efficient method for smoothing out the truss quickly.

If you look at individual frames, you'll see that the results are not perfect. However, when you play the flic, the motion makes the imperfections less noticeable. If you were cleaning up a real project, you might go into individual frames and make further refinements. For example, you may notice that unzag has somewhat blurred the joints of the truss members. And you might go back and apply unzag ink to segment A so that it is consistent with the smoothed images in the pullback.



Before Unzag Ink Is Applied



After Unzag Ink Is Applied Twice

**TIP** To reduce the staircase effect, choose colors that do not contrast strongly. Also, the faster the motion, the less obvious the jaggies.

## Doing a Reverse Optics Move

The third segment is another optics movement, but this time you won't use any of the preset selections. A rectangle will rise up from below the screen to meet the truss, forming the abstract image of a building. First you'll create the third segment and place the rectangle in its final position in relation to the truss. Then you'll move the rectangle to its beginning position below the screen. The last step is to render it in reverse.

### Setting the Third Segment

Segment B zipped by at only 10 frames. Now, at 40 frames it looks better, somewhat fast-moving compared to the first segment but not so fast that it has no impact. Segment C will also need to be longer than originally estimated to bring it into better proportion with the other segments. Try setting it at 25 frames, from frame 221 to frame 245.

---

### Setting the Third Segment

Continue from the previous exercise or reload TRUSS04.FLI and TRUSS04.SET.

Display frames panel and jump to frame 220.



Click left segment number box Click left segment right arrow

Sets start of segment at frame 221.

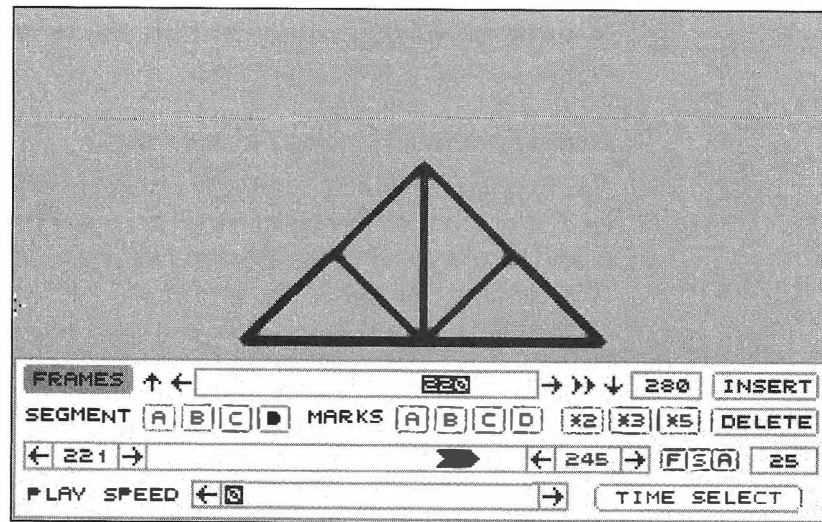
Right drag segment slider

Set end of segment at frame 245, using right segment arrows, if convenient.

Right click [C] segment button

Assigns these frames to [C] segment button.

Return to home panel.



Third Segment Set on Frames Panel

### Pasting the Truss

The truss will be stationary while the rectangle moves, so copy its final position from the previous segment onto all the frames of this segment by clipping and pasting with the [T] button still turned on.

### Pasting the Truss

Press <tab>

Clips cel of truss from frame 220, final position of pullback.

Display frame 221.

Click OPAQUE

Changes from unzag ink to opaque ink.

Make sure [T] button is on.

<i>Open</i> <b>CEL</b> <i>Select</i> <b>PASTE</b>	Displays cel.
<i>Right click</i> <b>screen</b>	Sets cel's position for pasting and displays time select panel.

Make sure [S] button is highlighted.

<i>Click</i> <b>RENDER</b>	Pastes cel to all 25 frames of segment C.
----------------------------	-------------------------------------------

---

If unzag ink had remained selected, the truss would not have been visible during or after rendering.

### ***Drawing and Clipping the Rectangle***

Now you can draw the building's rectangle below the truss and clip a cel of it to become the new moving element. First, make sure grid snap is still in effect and the grid is the one you created at the beginning of this chapter. To check the grid, open EXTRA and select the GRID submenu, then make sure USE is on and select VIEW to see the grid. When you draw the rectangle, the grid will snap its corners to align it with the truss.

---

### **Drawing and Clipping the Rectangle**

<i>Open</i> <b>SWAP</b> <i>Select</i> <b>CLIP</b>	Copies current image to swap screen.
<i>Click</i> <b>cluster</b>	Select one of the medium blues in cluster as the current color.

Check GRID USE and view the grid, noticing that the corners of the truss are aligned with it.

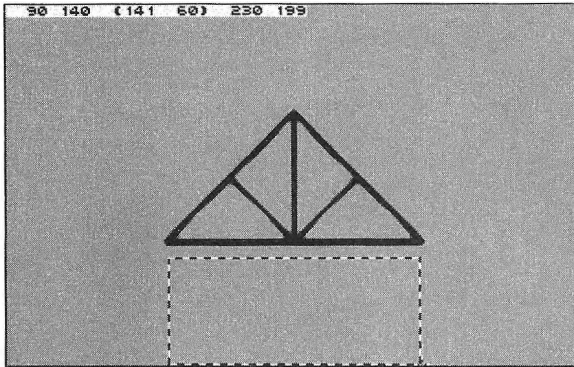
Return to home panel.

<i>Click</i> <b>BOX</b> <i>Click</i> <b>screen</b>	Set first corner at 90 140, just below bottom left of truss.
<i>Click</i> <b>screen</b>	Set second corner at 230 199 as illustrated.

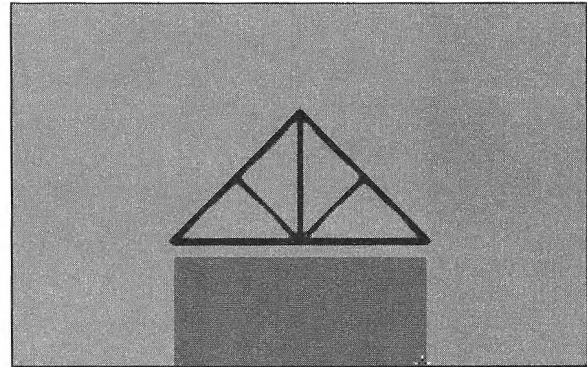
<i>Open</i> <b>CEL</b> <i>Select</i> <b>GET</b>	Pick two points to encompass only the rectangle in new cel.
-------------------------------------------------	-------------------------------------------------------------

<i>Open</i> <b>SWAP</b> <i>Select</i> <b>TRADE</b>	Returns image from swap screen.
----------------------------------------------------	---------------------------------

---



Drawing Rectangle Below Truss



Rectangle Drawn Below Truss

### ***Moving in Reverse***

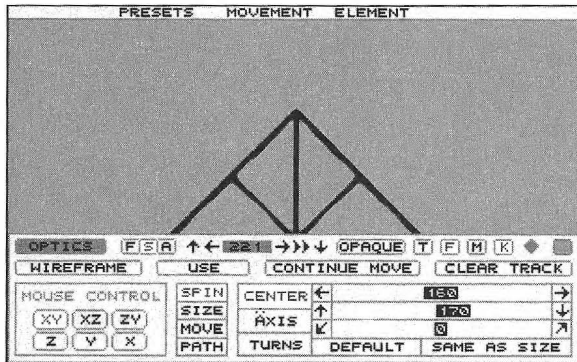
In the next exercise you'll create the optics movement with the rectangle, which has replaced the truss in the cel buffer. Instead of selecting one of the preset movements, you'll use the options on the optics panel to set up the move.

Because you've previously performed an operation on the optics panel, it's important to clear out all movement settings before doing another. By selecting **CLEAR ALL** on the **PRESETS** menu of the optics menu bar, you restore all the default settings on the optics panel. Menu items you've selected that are marked by an asterisk, such as the **CEL** item on the **ELEMENTS** menu, are not affected.

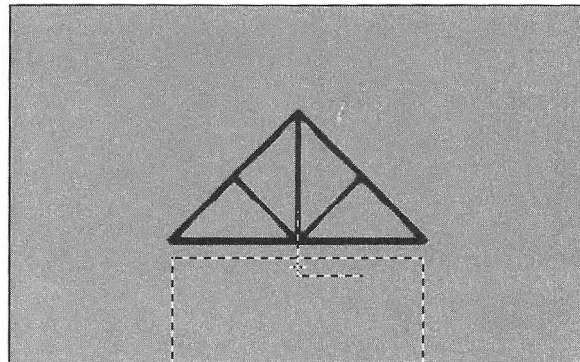
Before creating a new movement, you often need to reset the element's *center*. Do this by selecting **CENTER**, one of the options displayed on the optics panel when **SPIN** is highlighted. The default center for all optics movements is the geometric center of the object. Before you begin moving the cel, you'll reset its center to near the cel's top edge. To place the center, you click on screen, click in the center icon, drag it to a new position, and click again to set it.

**NOTE** *You can pick two points with your cursor to specify an optics move. The element will then be moved by the distance between these points, from its original position, in the direction of an imaginary line from point one to point two. Although these points can be anywhere on screen, and need not be picked in relation to the element's wireframe*

*representation, it's often easier to visualize the move by picking the first point on the element's wireframe center, and picking the second point relative to it.*

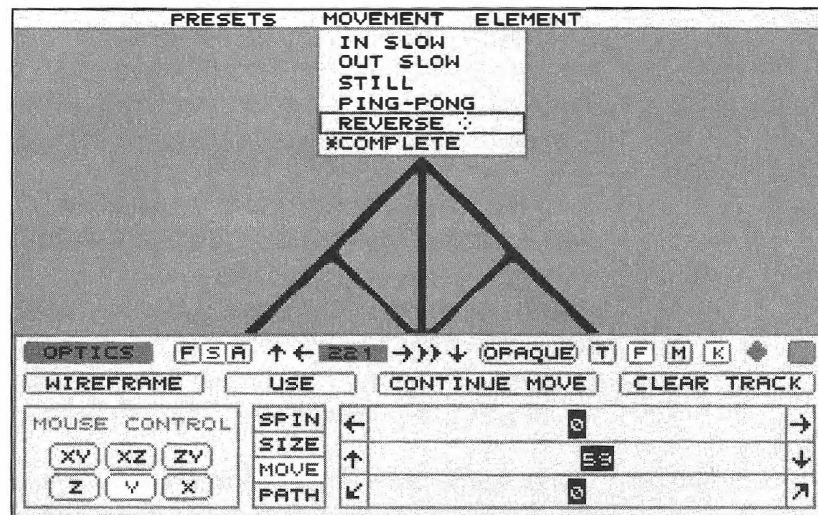


Selecting SPIN CENTER on the Optics Panel



Moving the Center Icon

After you set the center, you'll select MOVE on the optics panel, which allows you to move objects — that is, to paste them — in a straight line over a sequence of frames. The object can move along one or more of the X, Y, and Z axes, or in accordance with the options on the MOVEMENT optics menu.



MOVEMENT Menu on Optics Menu Bar

You can choose to adjust the timing of the sequence so that the object moves in a *slow in* or *slow out*. The former movement starts slowly and accelerates; the latter decelerates at the end. You can also reverse the movement, as in the following exercise. These menu options are duplicated as buttons on the time select panel.

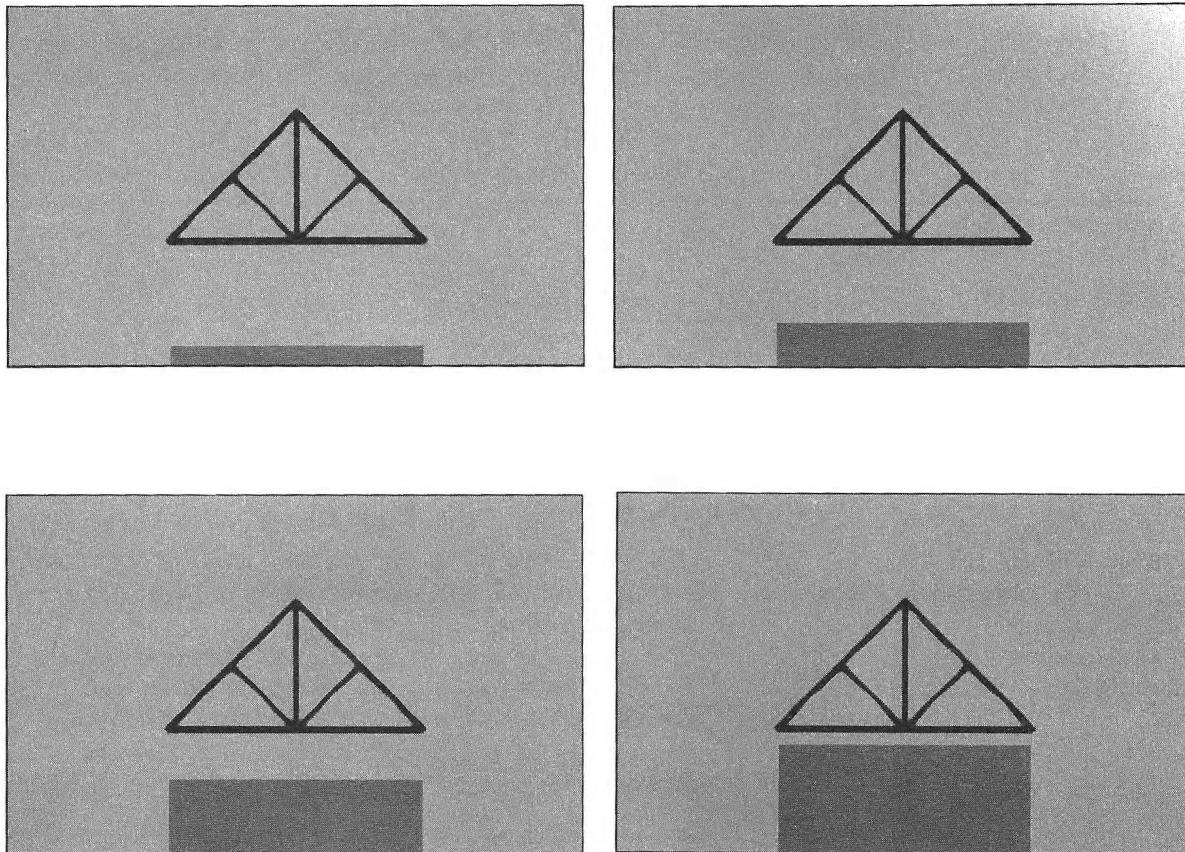
---

### Moving in Reverse

Type <b>opc</b>	Displays optics screen, all settings cleared.
Click <b>SPIN</b> Click <b>CENTER</b>	Selects option to set center.
Click <b>screen</b>	Displays wireframe cel and center icon at default location.
Click <b>center icon</b>	Click on center of icon.
Move <b>cursor</b> Click <b>screen</b>	Move center icon up to top edge of wireframe and set new position.
Click <b>MOVE</b>	Highlights move option and displays axes for movement.
Click <b>[Y]</b> mouse control button	Sets to move cel only vertically along Y axis.
Click <b>screen</b>	Displays wireframe for moving.
Click <b>screen</b>	Click on center icon, on top edge of wireframe cel.
Move <b>cursor</b> Click <b>screen</b>	Move wireframe cel down off bottom of screen and then click to set position.
Click <b>wireframe</b>	Displays the cel's movement as wireframe image. Notice that the movement is not yet reversed.
Open <b>MOVEMENT</b> Select <b>REVERSE</b>	
Click <b>USE</b>	Displays time select panel.
Make sure [S] is highlighted, REVERSE is highlighted, and 25 in total frames box.	
Click <b>PREVIEW</b>	Return to time select panel when finished.
Click <b>RENDER</b>	

Return to home panel and play this segment.  
Save flic as TRUSS05.FLI and settings as TRUSS05.SET.

---



*Rectangle Moving Up*

If the wireframe movement isn't correct, you can adjust the move before proceeding to the time select panel. You can select **CLEAR TRACKS** to reset the X,Y,Z axis settings back to zero for the **MOVE** or select **CLEAR ALL** on the **PRESETS** optics menu if you want to restore all the default settings on the optics panel. The selections you've made on the other optics menus remain in effect, so you need not select **REVERSE** again on the **MOVEMENTS** menu or **CEL** on the **ELEMENTS** menu.

After you preview the movement on the time select panel, you can choose another option, such as **PING PONG**, without returning to the optics panel. You can cancel at any point before rendering and return to the optics panel to refine the move further.

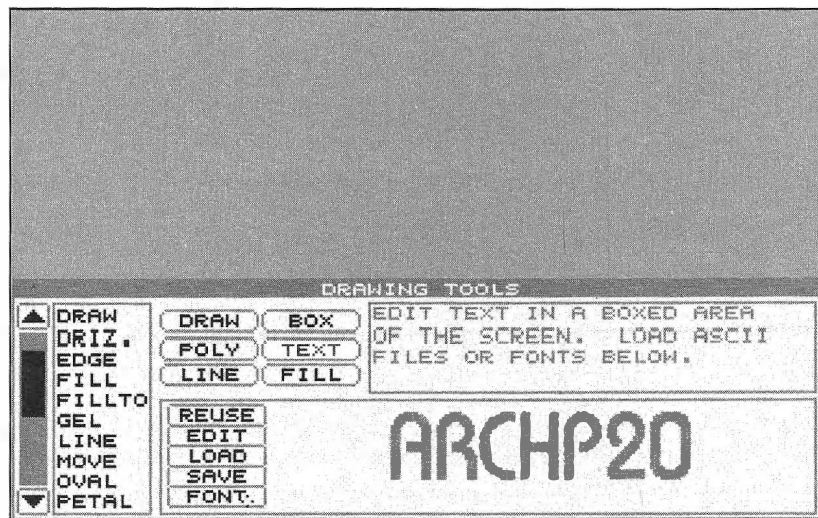
## Creating the Title

For the last part of the animation, you'll create a still title and a drop shadow to be combined with the image at the end of the third segment. The easiest way to do this is to prepare the text and shadow separately, place it where you want it to appear in relation to the truss and rectangle, and then insert as many duplicate frames as needed to complete the flic.

### *Preparing the Text*

To prepare the text, you'll select a font and enter the text on the first blank frame, which is after the end of the third segment. Because you're working on only one frame, you'll use the text tool, rather than the titling panel.

**NOTE** *The ARCHP20.FNT font you are instructed to load in the next exercise is one supplied on the AA bonus disk that you get when you register Animator. If you don't have this font yet, you can load DECO24.FNT instead.*



*Text Font Selected on Drawing Tools Panel*

---

## Entering the Text

Continue from previous exercise or load the TRUSS05 flc and settings files.

Jump to frame 246.

*Right click* **TEXT**                      Displays text tool options on drawing tools panel.

*Click* **FONT**                              Displays fonts file selector.

Load ARCHP20.FNT and return to home panel.

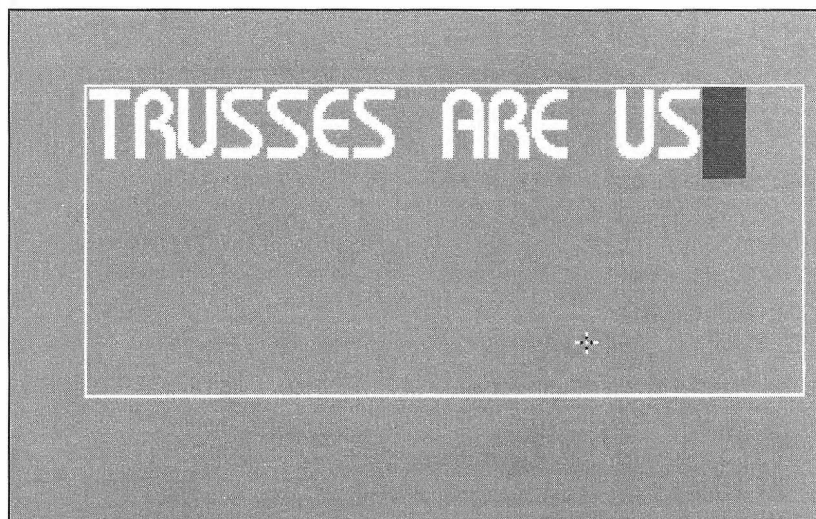
*Click* **mini-palette**                      *Select* white as current color.

*Click* **screen** twice                      *Set* editing box to encompass most of top half of screen,  
as illustrated.

*Type* **TRUSSES ARE US**

*Right click* **screen**                      Pastes text.

---



*Text Entered in Editing Box*



### *Preparing the Drop Shadow*

Now you can make the drop shadow for the title. You'll clip a cel of the text and paste it in dark ink to create the shadow. Then bring the cel back again, move it slightly to the left of the shadow, and paste the text in white opaque ink.

In order to move the cel in increments fewer than ten pixels, you'll turn off grid snap. And you'll turn off the [T] button so that the cel is pasted onto only one frame.

---

### **Shadowing the Text**

*Press <tab>* Clips cel of text.

Turn off [T] button and turn off USE on GRID submenu.

*Type x* Clears screen.

*Right click SCRAPE* Displays ink types panel.

*Click DARK* Select dark ink to replace scrape ink.

Return to home panel leaving dither off and the default ink strength of 50 percent.

*Type ` Right click screen* Pastes cel in place using dark ink.

*Click OPAQUE*

*Type ` Click screen* Picks up cel to move it.

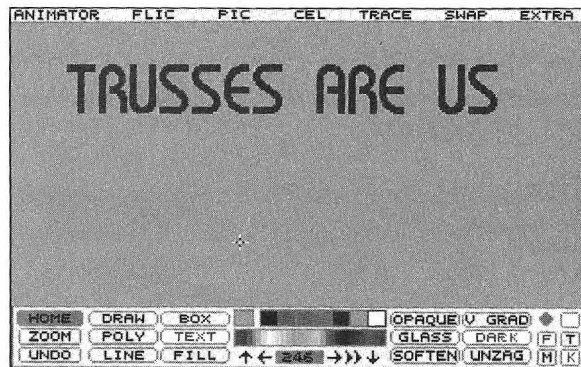
*Move cursor* Move cel to left until second set of status numbers reads -3 -1.

*Click screen* Pastes cel in new position in white ink.

*Press <tab>* Clips cel.

Save cel as TRUSS.CEL.

---



*Shadow Pasted*



*Title Pasted on Drop Shadow*

**TIP** *An alternative to turning off the [T] button in this situation is to select [F] on the frames panel, which restricts the action to the current frame. If you do so, however, the time select panel is displayed and you must then select RENDER to paste the cel.*

### ***Combining Image and Title***

The title is ready to be placed above the image of the truss and rectangle. In the following exercise you'll clip the image at the end of the third segment and paste it and the title cel to a blank frame. Then you'll insert 179 duplicate frames to complete the flic.

---

### **Combining Image and Title**

Step back to frame 245.

Open **SWAP Select CLIP**

Step forward to frame 246.

Open **SWAP Select TRADE**

Type **`** and Click **screen**      Picks up cel.

Move title cel to center it over image and click again to paste it, as illustrated.

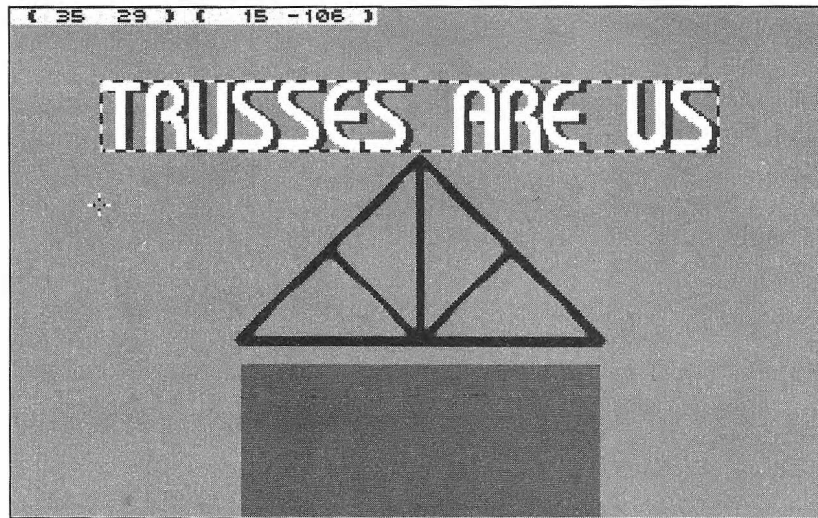
Right click **frame control icon**

Insert 179 frames after frame 246.

Play the entire flic several times.

---

You now have 459 frames, of which the last 34 frames are blank.



*Image Combined With Title*

Instead of inserting frames, you could get the same results by creating a fourth segment and pasting the image and the title to all the frames. However, rendering each of 179 frames is much more time-consuming than making 179 duplicates.

## Finishing Touches

In playing the flic, you can observe areas where further refinement is desirable. You added a hold at the end of the first segment, but not at the end of the second or third. It would improve the flic's pacing to add those holds now. And the blank frames at the end should be deleted.

In the next exercise, you'll first delete the leftover frames at the end. Then you'll go back to insert frames for holds after the second and third segments.

---

## Polishing the Pace

Jump to frame 425.

*Right click total frames box*

*Enter 425 Click OK*

*Click YES*

Displays dialogue box to set total frames in flic.

Displays message that this chops frames off at end.

Deletes 34 blank frames at end of flic.

Jump to frame 245, the last frame of segment C.

*Right click INSERT*

*Enter 20 duplicate frames for a hold after segment C.*

Jump to frame 220 and insert 15 frames for a hold after segment B, for a total of 460 frames.

Play the flic several times.

Save it again as TRUSS05.FLI.

---

After playing the flic, you may decide the pacing is not quite right, even now. Follow your instincts about shortening and lengthening holds between the segments. If you're going to be moving back and forth more, you might assign certain frames to the marks buttons for convenience.

### *Adding Your Own Touches*

The ending of this flic could be spiced up. You may well have ideas you've been waiting to try. Here are a few more suggestions. You may want to continue now or perhaps return to them later. Make sure to save the final version of the flic and the settings.

Try adding a segment of falling snow and pasting the image and title onto it. The general idea is as follows.

---

## Making It Snow

On home panel, replace poly tool with streak tool.  
Set brush size to 2.

On palette screen, get a cluster of 16 slots, ramp values from white to the blue key color, and select it as the current cluster.

Turn off FTT.  
Open PALETTE menu and select CYCLE DRAW.

Jump to frame 460.

Display the full screen and draw vertical, somewhat wavy lines from top to bottom of screen with the streak tool, alternating left and right sides of screen to increase scattered effect.

Create a segment of sixteen frames at end of flic.  
Make sure [T] button is on.  
On palette panel again, open ARRANGE menu and select CYCLE.

Preview and render segment.  
Paste image and title (TRUSS.CEL) onto snow scene.

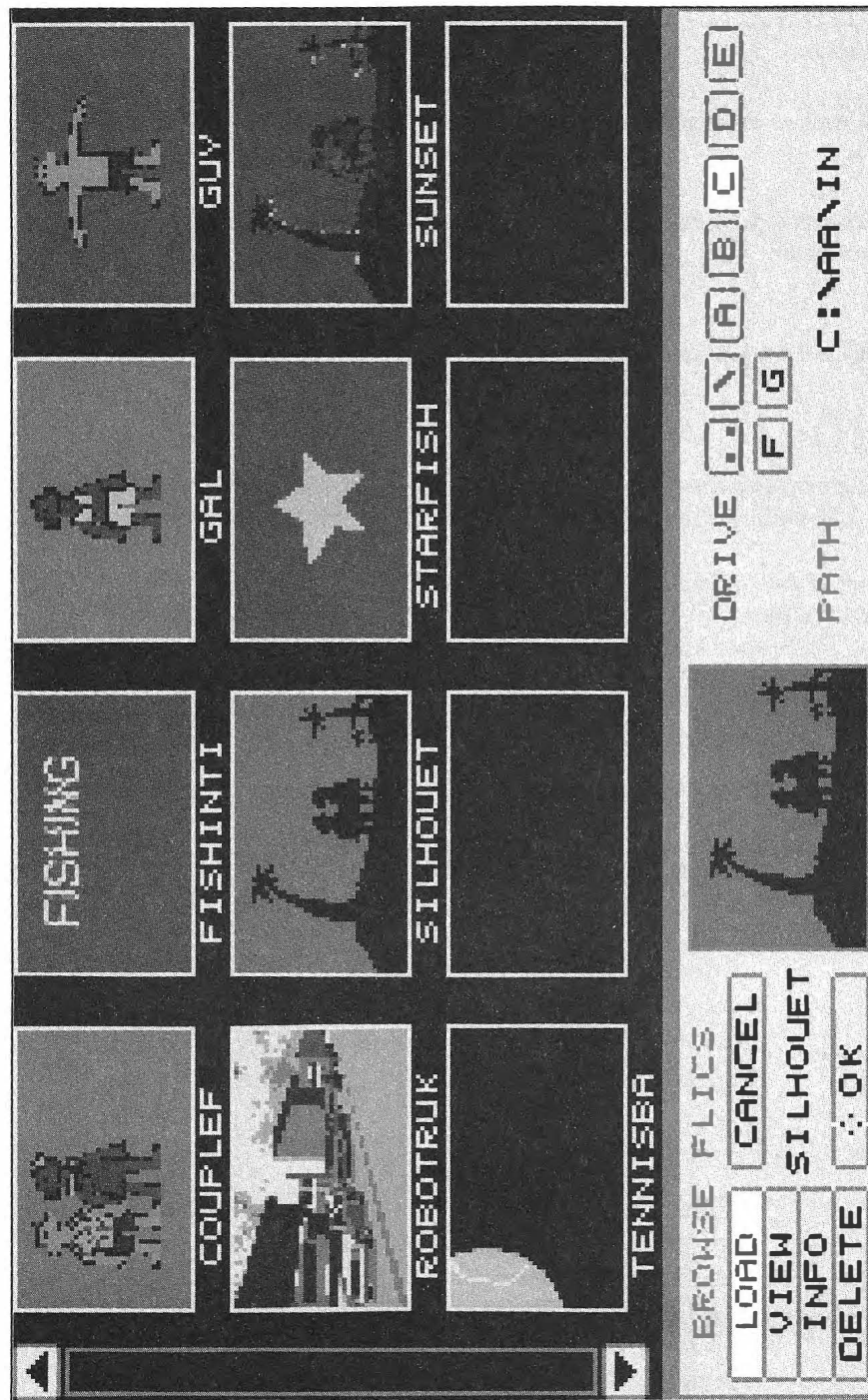
---

A variation of this idea is to paint snow falling on the truss and piling up, like the illustration at the beginning of this chapter.

Other possibilities might be to choose some of the transition options for joining flics. By making the frames for the titling a separate flic, you can then bring the title on in a *dissolve* or a *wipe*. These and other special imaging effects are illustrated in Chapter 13.

## Next Steps

This chapter ends Part 1. You've now completed the basic introduction to Animator. The seven chapters in Part 2 offer more in-depth concentration on animation techniques you can adapt for real projects. Chapter 8, which follows, takes you through creating a cycle of frame-by-frame animation, adapting classic techniques to Animator's capabilities.



## Perfecting Animation Techniques

Part 2 builds on the fundamentals covered in Part 1. In these chapters, you'll create the elements of a project — a promotion for a resort, Club Baltic, on the shores of a newly trendy travel spot. Each chapter in Part 2 teaches you a different animation technique:

- Chapter 8 shows you how to do classic cel animation.
- Chapter 9 demonstrates titling effects.
- Chapter 10 gives you more exposure to color cycling.
- Chapter 11 explores metamorphosis or polymorphic tweening.
- Chapter 12 takes you through optical effects.

The elements you'll create include a cycle of a character performing calisthenics on the beach, a color-cycled sunset, titles that dissolve underwater, a seagull that follows its own eccentric path, and other transformations of color and shape. In Part 3, you'll combine these elements to put the animation together.

The storyboard for the completed animation is on the following pages, so you can refer to it whenever you'd like to check your progress. A series of frames from a completed version of the animation is at the end of Chapter 13. Although the exercises assume you'll be aiming at fully realized illusions and artistic results, feel free to simplify the drawings if you merely wish to see roughly how a technique works. On the other hand, go ahead and paint the background and the various images for the moving elements more elaborately than the exercises indicate, if you like.

If you have the IN DISK, you can choose to substitute files from the disk and skip some exercises. If you plan to complete the Club Baltic animation in Chapter 13, you'll be advised to keep certain files. We'll

let you know which files you've saved during the course of a chapter may be deleted at the end to conserve disk space.

**NOTE** *You no longer need any of the files you created in the first part of the book, so you can delete all the files in your \AA \IN directory (except the IN DISK files, if you have them). The IN DISK files are identified by names beginning with the letters IN, followed by a chapter number, such as IN05HOUS.GIF.*

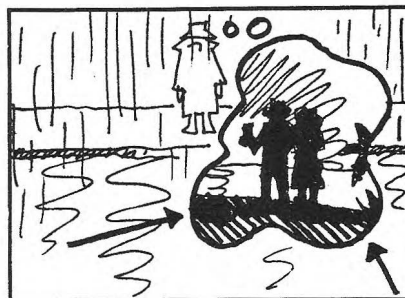
In addition to learning how to develop the parts of a project, you'll acquire techniques that can be applied to sales presentations, training demos, and all sorts of industrial and commercial animations. Each chapter also offers samples of projects that professional animators have done in Animator, showing a range of styles and effects.



LEE MARRS **ARTWORK**



1 The sun sets.



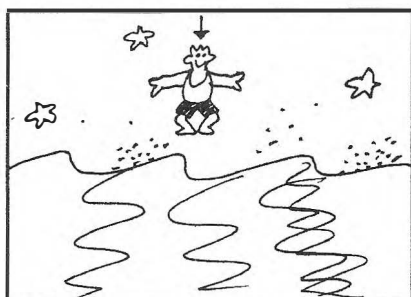
2 The sunset scene shrinks into a thought balloon in the rainy day man's head.



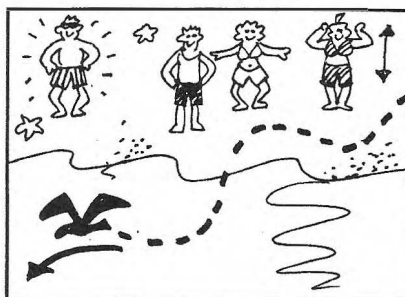
3 The rain falls.  
Scene dissolves to...



4 ... a beach scene with the guy in exactly the same position as previous scene. He has a surprised expression.

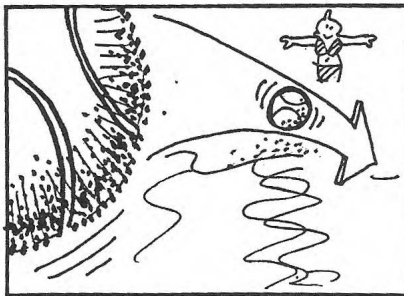


5 He smiles and begins exercising.

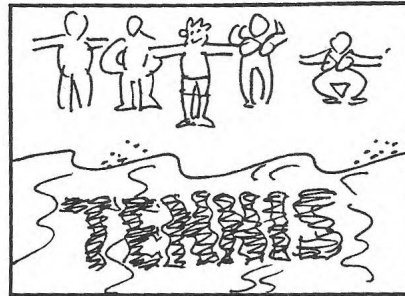


6 One by one his companions pop on and exercise with him, while the bird appears from upper right corner and flies off lower left.

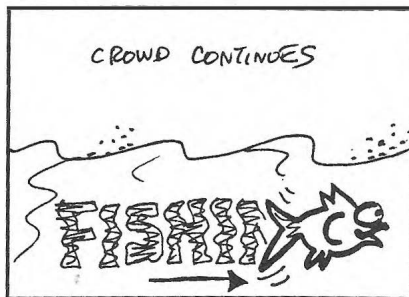
LEE MARRS **ARTWORK**



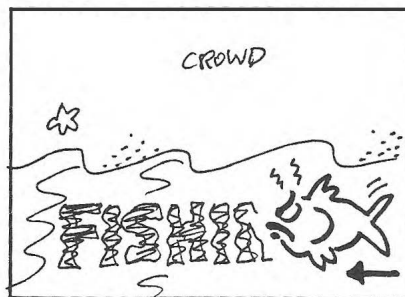
7 A large tennis ball fills the screen wiping the screen.



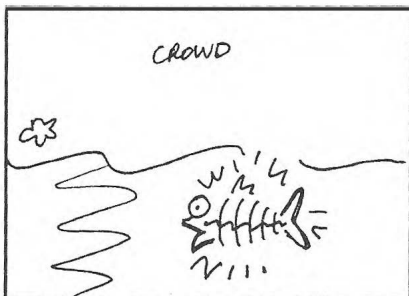
8 The wife has left the word TENNIS reflected in the water, animating. Then dissolves.



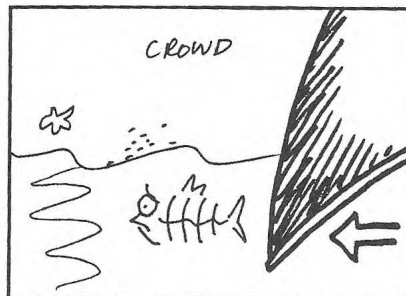
9 A fish swims across from left to right, wiping on the title FISHING.



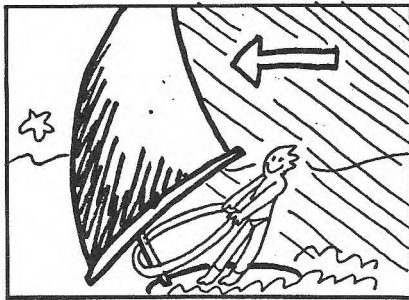
10 The fish immediately returns and does a furious "take".



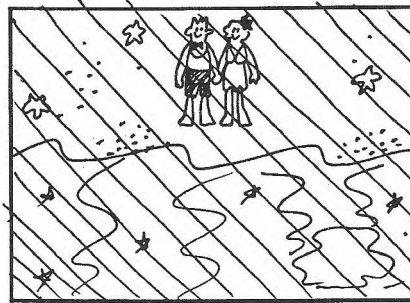
11 The fish metamorphosizes into a skeleton with a look of surprise.



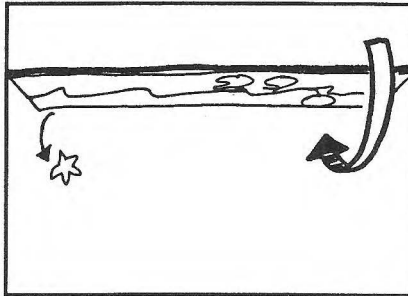
12 The sail of the windsurfer moves from the right covering the fish.



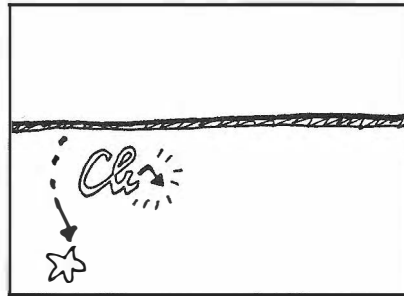
13 The windsurfer wipes across the screen revealing...



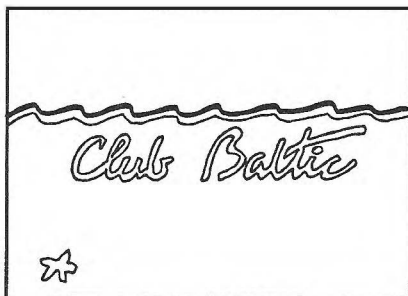
14 ... A mood lit scene of a guy & a gal. They are dressed in a festive fashion?



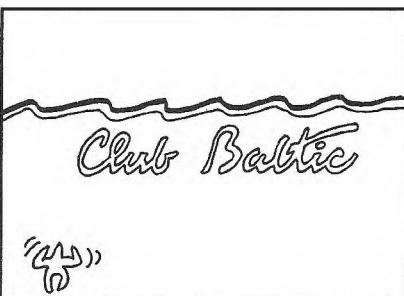
15 The image flips, as the starfish falls out of the scene into the new background.



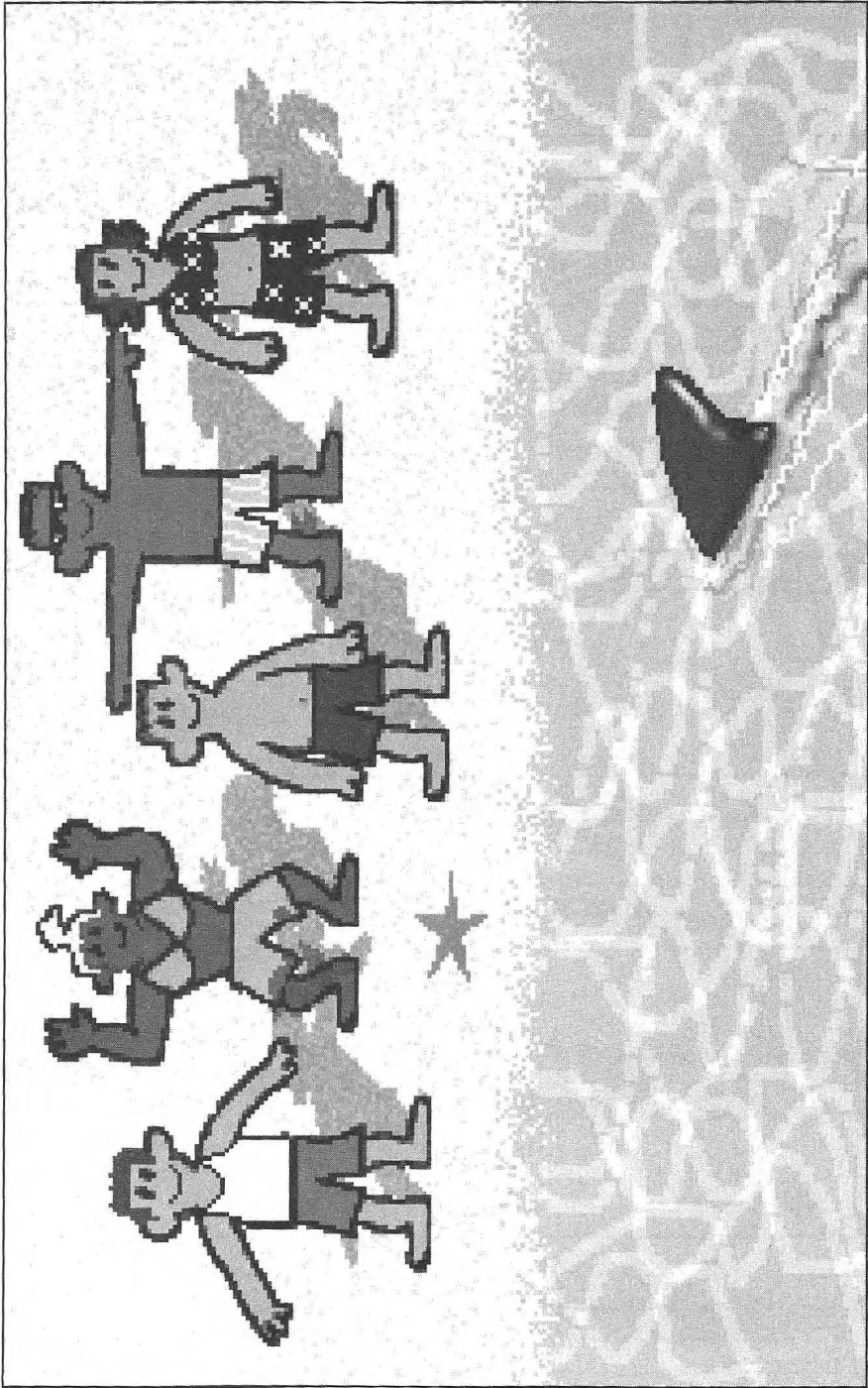
16 The starfish lands and the titles write on.



17 As the titles finish, the line becomes moving waves.



18 After a momentary pause, The starfish begins to exercise.



*All Together Now...*

# Classic Animation Cycles

Once upon a time, in the days before computers, animators perfected techniques for creating the illusion of movement. They became adept at drawing complex sequences like the one many of us shuddered at in childhood — the little pig prancing down a forest trail, with the wicked wolf glowering and lurking about in shadows that seem to turn into grasping claws.

Much of animation's artistry comes from observing the natural world. "How," an animator asks, "does an animal walk? How would a stylized animal like a cartoon pig prance? What does a wolf's head look like from all angles, and how would the mouth and eyes move if it glowered? How do shadows gradually lengthen and distort their shapes to resemble claws?"

Classic animation is the result of sometimes minute changes from one frame to another. Often, hundreds of drawings are required to capture a movement. Techniques have evolved for designing sequences of drawings based on recurring patterns. Especially in *character animation*, the kind of classic animation featuring a distinctive actor (Little Pig Number 2 rather than just any pig), movements are designed to be used again. For example, a character walking a few steps can be inserted into the animation wherever necessary, and the frames can be repeated for a longer walk. Such a sequence, called a *cycle*, is a staple of classic animation.

This chapter takes up the classic animation techniques you can replicate in Animator. The focus is on character animation, specifically on the two primary techniques for executing a cycle. One is drawing *straight ahead*, or starting from one position and drawing each frame until you reach the end position. The other is drawing *key poses*, which involves drawing the beginning, end, and the most important intermediate positions, then filling in the gaps. In the exercises which follow, you'll create one brief cycle of a figure doing

aerobics. Then, you'll recycle the frames, modifying them until you have the moving elements for a crowd of fitness enthusiasts.

Basically, animating a character is like animating any moving element. You need to plan the character's position at the beginning and end of a sequence, the duration of the sequence in which the character changes its position, its relationship to the background and to other moving elements in the sequence, and other relevant spatial and temporal information. You can then draw the character going through the movements that constitute the sequence.

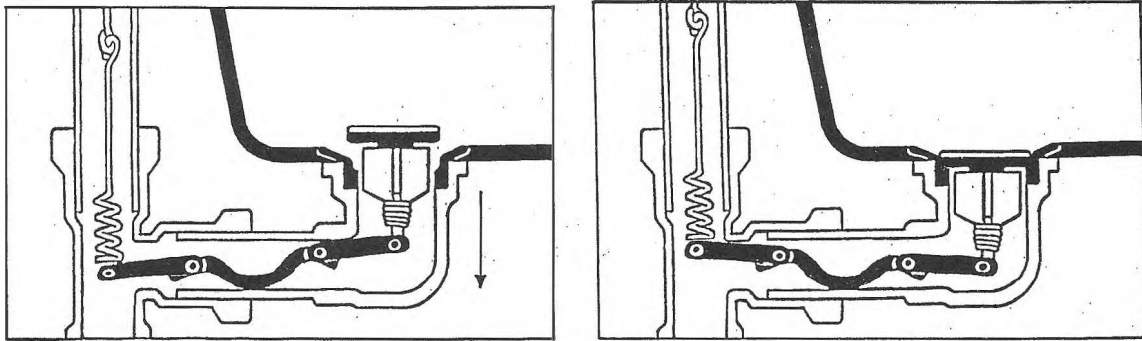
Although classic animation is based on hand-drawn images, you need not draw them all in Animator. You can use scanned images as well as drawings done in AutoCAD, AutoShade, or other compatible paint programs.

## Drawing Cycles

A cycle is a sequence complete unto itself that is designed to be repeated as many times as needed in various situations. Cycles are the basis of many industrial animations: fluid moving through pipes, wheels spinning, pistons pumping. As few as two frames can become a cycle of a light flashing on and off.

In character animation, a walk cycle is typically a few steps. The character lifts foot or paw or hoof and puts it down. In the last frame of a cycle, the character is in the position immediately before beginning another step. The cycle can easily be expanded by duplicating its frames as many times as necessary. The character can seem to cover many miles with a minimal expenditure of effort on the part of the animator. The file MRNUMO.FLI in the Animator sample files is an example of a walk cycle.

Depending on how elaborate the animation, other parts of the character's body shift, wiggle, and bob up and down. The personality of the character comes through as the animator interprets the movement more or less realistically.



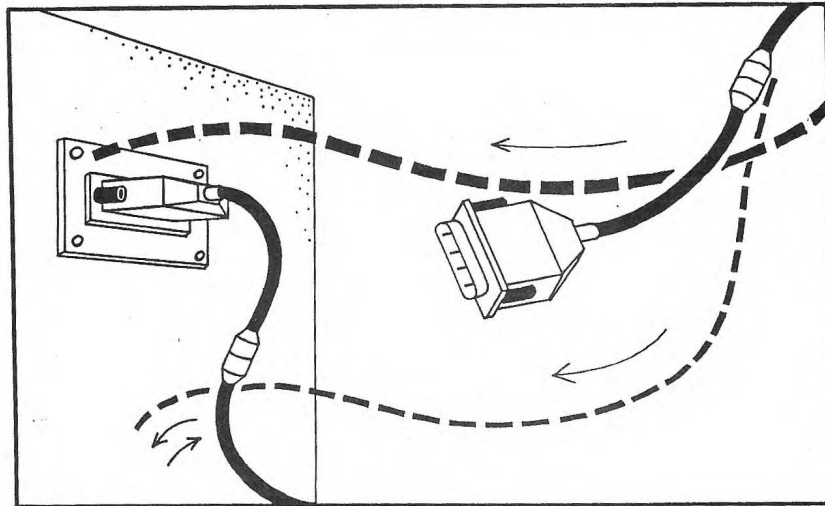
A Two Frame Cycle

A sequence in which all or most of the parts of the body move is *full animation*. For example, a fully animated sequence of a bird flying would include the wings rhythmically moving up and down, the tail moving side to side, and the chest rising and falling. A sequence of a bird flying in which only the wings move is *limited animation*.

Both full animation and limited animation have their places, according to the style and degree of detail desired. Limited animation is prevalent in Saturday morning cartoons, where only a character's mouth moves during dialogue, without the eye and head movements that would produce more realistic facial expressions. However, when designed cleverly, limited animation can look quite good. Experienced animators can tell what needs to move and what doesn't and still give the impression that everything is moving.

**NOTE** *If you are an experienced computer animator, you'll find that minor changes seem more dramatic in Animator than on higher resolution systems.*

Whether a cycle is fully animated or limited, the movements follow *motion paths*. Suppose, for example, that a little girl is skipping along, swinging a basket. You could draw the bobbing head along one motion path, the swing of the basket along another, the rise and fall of her skirt along a third, and so on for all the movements in the sequence. If her hair is in a ponytail, it would follow its own path.

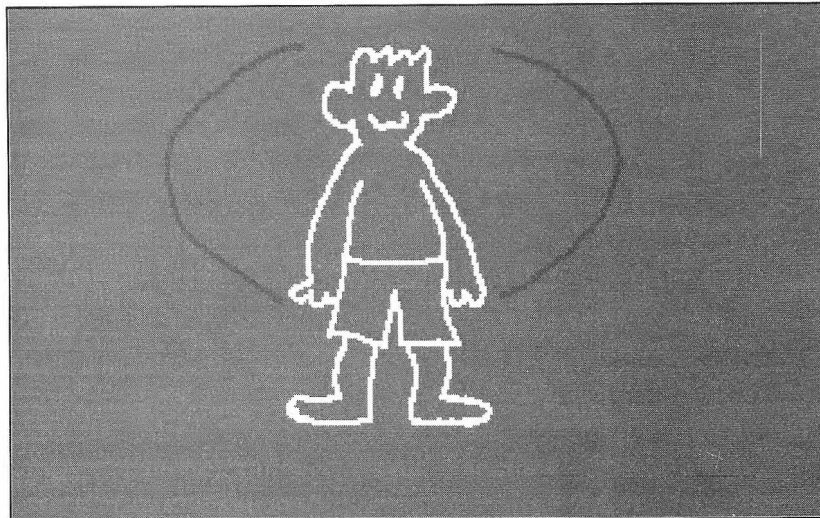


*Example of Motion Paths*

To see how to animate a character, you'll work first with an outline of a figure whose arms move in an upward arc over six frames. The rest of the body does not move. Therefore, you can start with the beginning position on the first frame and change only the upper body on the next five frames, following the motion paths in the illustration.

For those who have the IN DISK, this drawing is IN08GUY.GIF. If you don't have the IN DISK, or if you want to draw the figure yourself, the next exercise tells how to do so. You're welcome to improvise in giving the figure more personality, so long as you stick to a simple outline. If you are just interested in seeing how the techniques work, you can draw a stick figure.





*First Frame of Cycle*

First, you'll select a medium gray color from the palette panel and change the background to gray. Then, you'll draw the figure in white opaque ink and the motion paths in orange ink, using a size 2 brush.

---

### Drawing a Character and its Motion Path

Type **fry**



Either load IN08GUY.GIF and skip this exercise, or do this exercise.



Do this exercise.

On the palette panel, change dark red in mini-palette to a medium gray (RGB 30, 30, 30 is good) and return to home panel.

Click **gray** Click **FILL**

*Flood* screen with gray background color.

Right click **brush**

*Set* brush size to 2.

Click **white** Click **DRAW**

*Sketch* character as illustrated.

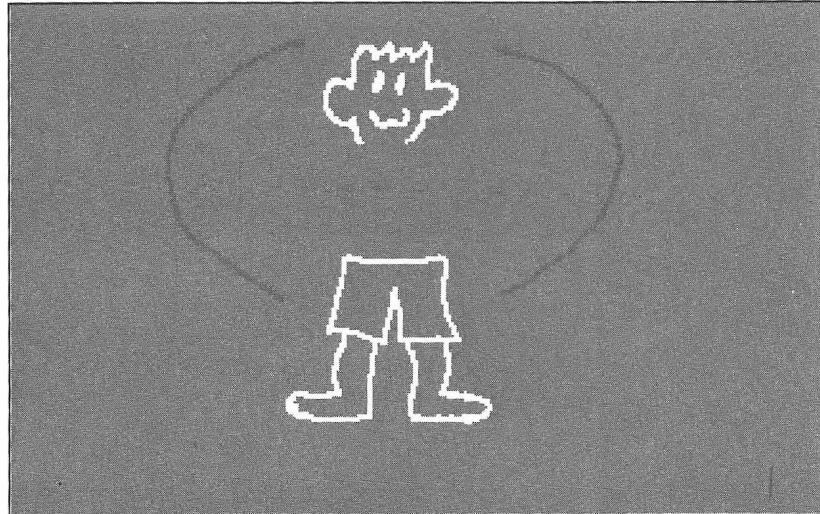
Click **orange** Use **DRAW**

*Add* motion paths as illustrated.

Save as GUY.GIF.

---

Now you've drawn the first frame of the six-frame cycle. In the following exercise, you'll copy this drawing to the swap screen so you can paste it back on the first frame again later. Then you'll erase the upper body and mask the rest of the drawing to prevent changing it inadvertently. By creating five more frames, the motion paths and the part of the figure that remains the same throughout will be duplicated on each one.



*After Erasing the Upper Body*

---

### Making the Mask and Frames for the Cycle

Type <b>sc</b>	Copies image to swap screen.
Right click <b>key color</b> Click <b>screen</b>	Replaces default black key color with medium gray.
Set brush size to 8.	
Click <b>gray</b> Use <b>DRAW</b>	Erase upper body and arms, as illustrated.
Set brush size to 2.	
Right click <b>[M]</b> Select <b>CLIP</b>	Creates mask of image on screen.

Right click **screen** twice  
Click **[M]**

Returns you to home panel.  
Turns on mask.

Right click **frame control icon**  
Right click **total frames box**

Displays frames panel.  
Enter six frames for flic and return to home panel.

Save flic as GUY01.FLI and mask as GUY.MSK and return to home panel.

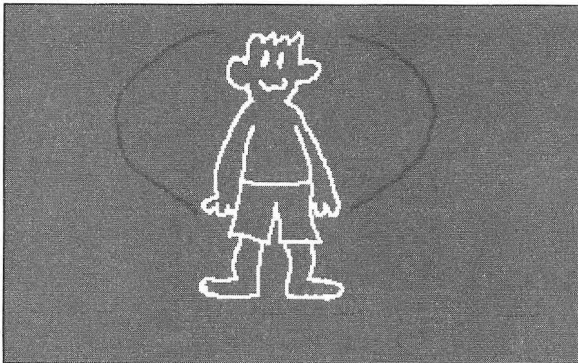
Type **sp**

Pastes original drawing on frame 1.

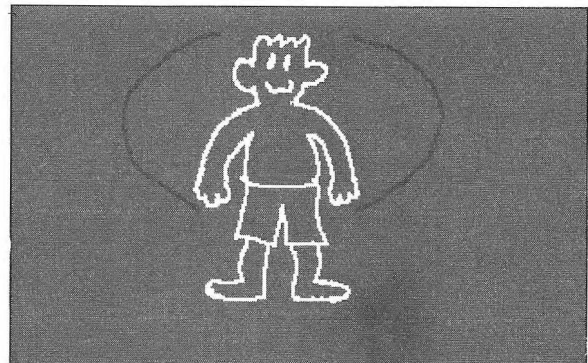
Now you have the original guy on frame 1 and five more frames of a guy with no arms or upper body. Instead of pasting the swap screen image, you could have used the scrape tool to restore the erased part of the original.

**TIP** *Even though you have the original drawing for frame 1 on disk, it's faster to work back and forth from the swap screen. The file is an additional safety net.*

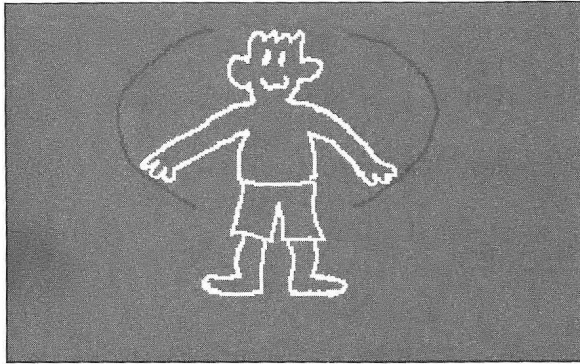
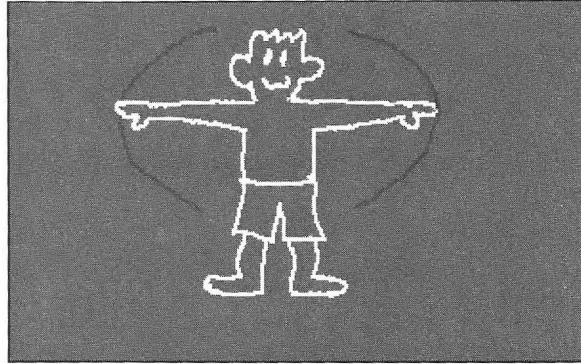
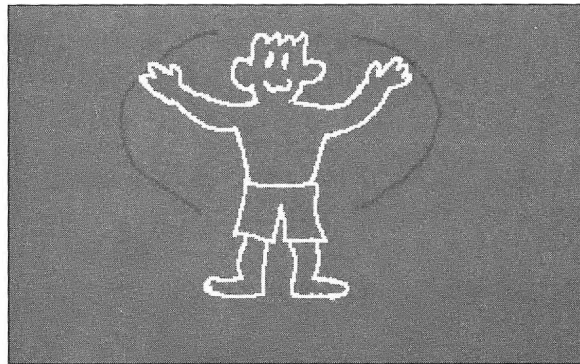
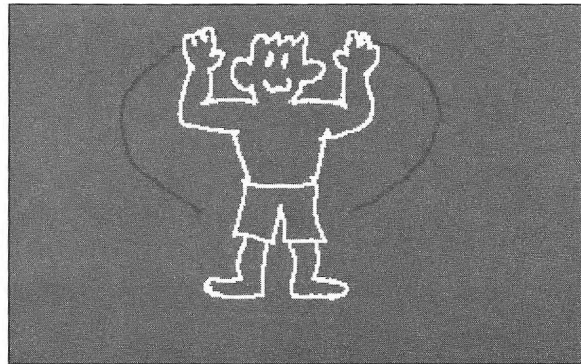
The remaining exercises in this chapter demonstrate how to animate the figure so that the arms move as shown below.



*First Position*



*Second Position*

*Third Position**Fourth Position**Fifth Position**Sixth Position*

## **Drawing Straight Ahead With NEXT BLUE**

The technique of drawing straight ahead is pretty much what the term suggests. You draw a starting position for a sequence, determine the motion path, and alter the drawing on each succeeding frame until you arrive at the end position. Suppose, for example, that you're drawing a character falling over and landing on its nose. Or a baseball sailing past a tree, circling around it, and breaking a window. With the path marked out, you draw until the character is on its nose or the ball makes contact with the window.

Because you invent the intermediate positions as you go, drawing straight ahead often produces sequences that seem like spontaneous

actions. The technique is very useful for conveying surprise and high emotion. It can, however, be difficult to draw straight ahead and end up exactly where you intend.

In Animator, you can approximate drawing straight ahead by using the draw tools and inks, changing each frame slightly or more obviously, according to the style of the animation. For example, you can draw parts to be changed from one frame to the next in a distinctive color, duplicate the frame, make changes, and then use the separate tool to erase the part that no longer belongs. You can make cels of parts that appear from frame to frame and keep pasting them to avoid redrawing on succeeding frames.

**TIP** *Keep the original image on the swap screen while you draw straight ahead, so that you can take cels from it if you accidentally change the contents of the cel buffer.*

### ***Blued Images***

To help you stay on track while drawing straight ahead, you can display all or part of an image from one frame as a *blued image* on the next frame. A blued image lets you keep a previous image in view, as a reference or to trace over and incorporate quickly into the drawing for the next frame. The blueing color is dark blue in the default palette; however, it can be any color that you place in the left-most slot of the mini-palette. When you no longer need the blueing, you can remove it by turning it to the key color.

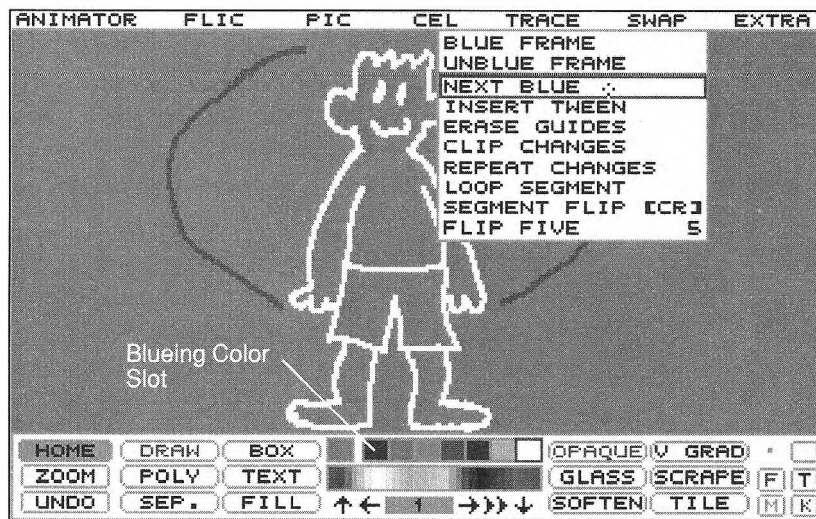
The following options on the TRACE menu let you work with blued images:

- **BLUE FRAME** turns the entire image on the current frame to the blueing color.
- **UNBLUE FRAME** removes a blued image by turning it to the key color.
- **NEXT BLUE** captures a blued image of only the changes made on a frame, removes any existing blued image, and advances to the next frame in the sequence, where it displays the new blued image.

To have the entire image you last drew as a reference while drawing the next position, you can insert a duplicate frame and select **BLUE FRAME**. Then you can trace over what is to be reused, or draw any

changes. You can select UNBLUE FRAME when finished to remove the blueing. To view only the changes made on each frame while you're making changes to the next frame you can select NEXT BLUE and keep selecting it to step through drawing a sequence. When you reach the final frame of the sequence you can select UNBLUE FRAME to remove the final blueed image.

Another option on the TRACE menu, INSERT TWEEN, lets you work with both a blueed image and a *greened* image. It's helpful in drawing key poses, as you'll see later in this chapter.



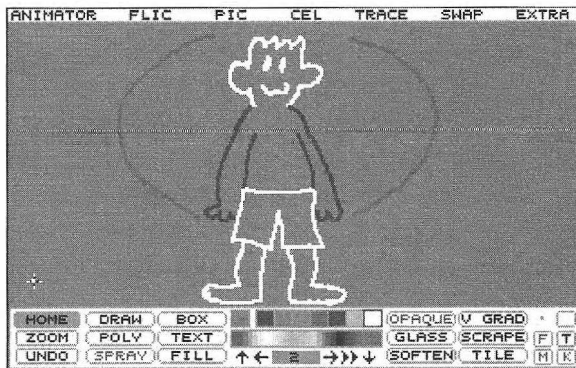
The TRACE Menu, NEXT BLUE Selected

**NOTE** Before using any function that applies the blueing color, make sure the color in the left-most slot of the mini-palette is not one of the colors in the drawing. If it is, change the color to one that won't be in the drawing. When the blueing is removed, everywhere the color appears on screen is changed to the key color, not just the blueed image. Also, make sure that the background color is the key color because unblueing changes the blueing color to the key color.

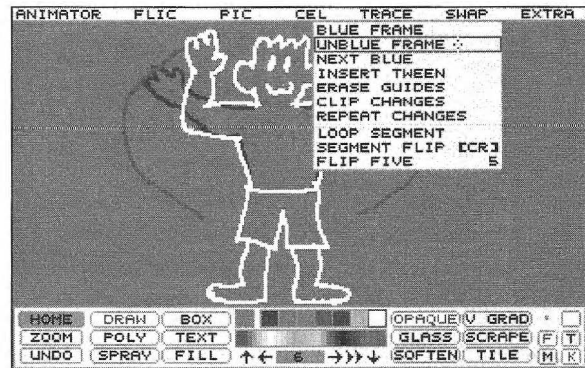
In the following exercise, you'll use NEXT BLUE to see the changes you made on each preceding frame as you complete the sequence of six frames. First, NEXT BLUE will transfer the changes made on frame 1 to frame 2 as a blueed image while you draw the next position. Then you'll continue to use NEXT BLUE and draw straight ahead to alter

the figure's position on the remaining four frames of the flic. Don't aim for symmetry. The animation will be more interesting if the arms are slightly different. You might also draw the torso to suggest an intake of breath as the arms ascend.

For NEXT BLUE to work for you, you must continue from the previous exercise. Reloading the flic would not provide the upper body changes for NEXT BLUE to capture.



*Blued Image on Frame 2*



*Unblueing Frame 6*

## Drawing Straight Ahead

*Click white*

Selects white in mini-palette as current color.

*Open TRACE Select NEXT BLUE*

Copies blued upper body to frame 2.

*Use DRAW*

*Sketch* upper body and arms in position for frame 2.

Continue selecting NEXT BLUE and drawing the next position on frames 3, 4, 5, and 6.

*Open TRACE Select UNBLUE FRAME*

Removes blued image from frame 6.

Play the flic and save it now as GUY02.FLI.

As you can see, the movement of the arms is a cycle, complete in six frames. At this point the movement may seem a bit awkward or stiff. You'll soon see different ways to improve it.



### *How NEXT BLUE Interprets Changes*

You may find using NEXT BLUE confusing until you become familiar with Animator's definition of what constitutes changing an image. When you select NEXT BLUE, the blued image includes only the pixels added while the frame has been continuously displayed. If you start with a blank frame, draw the first image, and select NEXT BLUE, the next frame will show the entire image, except for the key color, in the blued color. In this instance, everything you drew changed the blank frame.

If you start with a blank frame, load a previously drawn picture and alter it, when you select NEXT BLUE the next frame shows only the part you changed. For instance, if you load a bouquet of roses, draw a new bud, and select NEXT BLUE, the original bouquet will not be included in the blued image because it was drawn before the current frame was displayed. However, an image pasted from the swap screen buffer or from the cel buffer will be included in the blued image, no matter when it was originally drawn.

To use NEXT BLUE for an entire sequence, you must literally draw straight ahead, without backtracking or straying from the order of the frames. If you leave a frame, you cannot come back and pick up where you left off. In this situation, the changes to that frame will not be picked up by NEXT BLUE and no blued image will be shown on the next frame.

If you leave a frame while a blued image is shown, it will still be there when you return but NEXT BLUE won't remove it when stepping to the next frame. You'll have to unblue it after you finish the sequence. You have to wait until you finish the sequence because if you use UNBLUE FRAME on a blued image and then use NEXT BLUE, the unblued image will be included as part of that frame's changes.

Any changes you make after leaving and returning to a frame will be blued. For instance, if you draw a rose, go to another frame, and return to draw a second rose, when you select NEXT BLUE, only the second rose will be shown in the blueing color on the next frame. Displaying another frame in the sequence is, as you would expect, considered leaving the current frame. So is creating new frames and saving files, so plan ahead to create needed frames and save before or after completing the sequence.



Why, you may be wondering, was only the upper body copied in the blueing color to frame 2 in the previous exercise? That's the only portion of the original image that was pasted from the swap screen, because the rest of the figure was masked. It's also the only portion of the original image you need to use as a guide, because the rest of the figure has been copied identically to all the frames. For those who loaded IN08GUY.GIF, only the portion pasted from the swap screen constituted a change and was thus blueed. For those who drew the image, making new frames and saving the flic both were considered to be leaving the frame, so that only the portion pasted from the swap screen constituted a change and was blueed.

**TIP** *When you want to copy only a portion of a drawing with NEXT BLUE, a simple method is to leave the frame to clear the previous changes, then come back and trace over just that portion. An easy way to trace is to use the fill tool to change the lines to another color. To trace part of a line, break the line with the draw tool and the same color to stop the fill from going beyond the portions of the lines you want traced.*

To view other frames without accidentally interrupting the sequence while drawing straight ahead with NEXT BLUE, you can select LOOP SEGMENT, SEGMENT FLIP, or FLIP FIVE from the trace menu. The first two were covered in Chapter 7. FLIP FIVE plays through the most recent five frames, ending with the current frame. Each of these returns you to the same frame and is not considered leaving the frame.

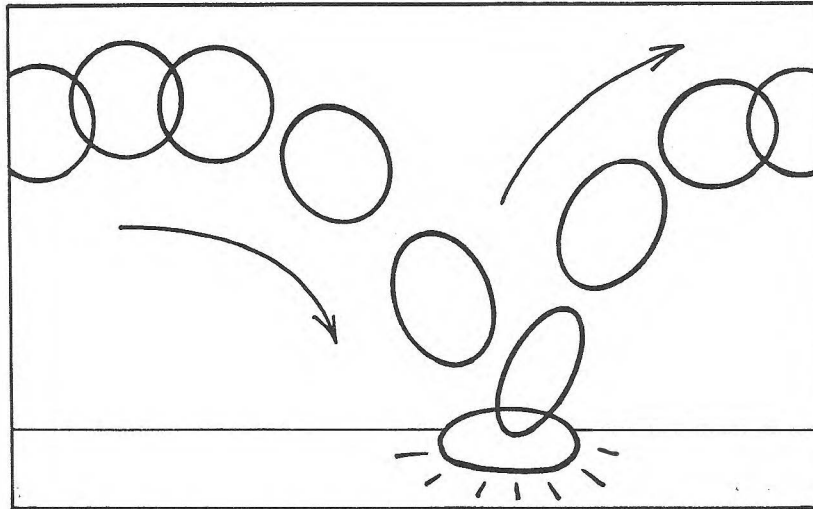
An odd consequence of the way Animator defines a change in pixels can occur when you erase part of a drawing. If you erase a detail drawn while the current frame has been displayed by changing its color to the key color, the erasure is not included in the blueed image. If, however, you erase a detail from an image that predates the current frame, the erasure is a change and is included in the blueed image.

**TIP** *When you need to start drawing straight ahead again with NEXT BLUE after getting off track, first use UNBLUE FRAME to get rid of the pasted blueed image. Then leave the frame, come back and draw any changes to the image and select NEXT BLUE to continue. To include any changes previous to leaving the frame, trace them as described above.*

## Drawing Key Poses and Inbetweens

Commercial projects often demand that actions fit into a carefully devised layout. Under such circumstances, you may need to use the technique of drawing key poses. Key poses are the main positions, also called *extremes*.

The beginning and end positions are, of course, key poses. For a two-step walk cycle, other key poses might include the positions at which each leg reaches its highest point and each foot makes contact with the ground. When the motion path is a series of arcs, such as a ball bouncing, key poses would be those at the bottom and top of each arc, at least.

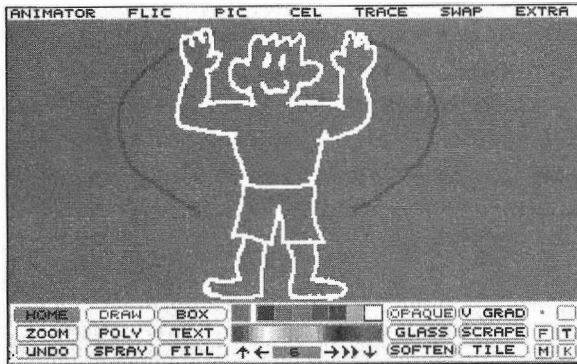


*Key Poses for Bouncing Ball*

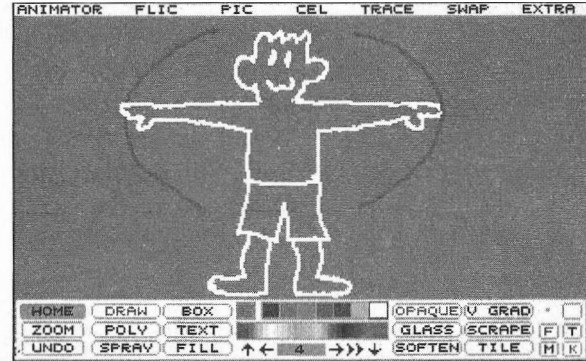
In contrast to drawing straight ahead, animating by key poses typically consists of two stages. First, all the key poses are drawn. Then the *inbetweens* are drawn; that is, all the positions that show the changes needed to get from one key pose to the next.

**TIP** *Classic animation relies on this technique as a means of freeing up senior animators after they draw the key poses. With the style and spirit of a sequence firmly established, assistant animators can complete the intermediate drawings.*

The exercise cycle you just created could have been done by drawing the key poses first. The order would have been different. You would have drawn frame 1 first and then the position in frame 6. The position you drew for frame 3 or frame 4 would have been another key pose, probably with the arms stretched out straight. Then you would have drawn the remaining frames as inbetweens.



*Last Key Pose for Cycle*



*Middle Key Pose Drawn for Cycle*

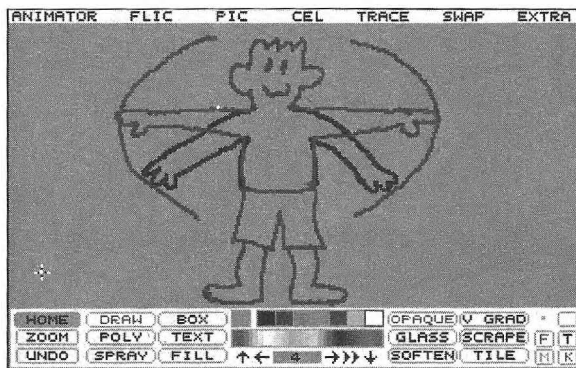
### ***Drawing Inbetweens***

In classic animation, transparencies of the key poses serve as references while drawing the inbetweens. Animator provides a similar tool to see the images on two adjacent frames as references while drawing an inbetween on a new frame inserted between them. When you select INSERT TWEEN on the TRACE menu, a new frame is inserted following the current frame. The new frame displays the image from the previously displayed current frame using the color of the left-most slot of the mini-palette (by default the dark blue) and the image on the following frame using the next color to the right in the mini-palette (by default dark green). Elements common to both frames appear only in the second color (dark green).

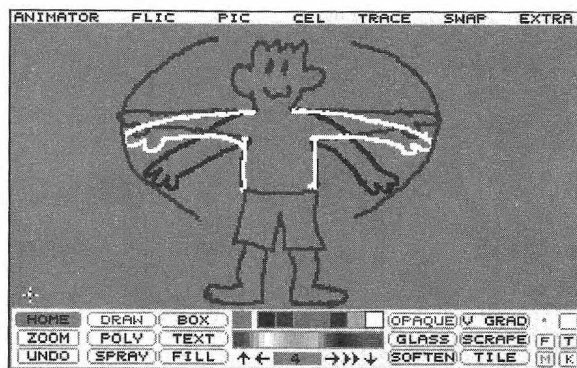
After you've drawn the inbetween, you can change both the blue and green images to the key color background by selecting ERASE GUIDES on the TRACE menu. Alternatively, you can draw all the inbetweens and then remove all the guiding images at once by turning on the [T] button before selecting ERASE GUIDES.

You can also select INSERT TWEEN to add more positions to a sequence you've drawn straight ahead. This is a good way to smooth out a movement or slow it down. Such additional frames are called *cushioning*. In the following exercise, you'll add an inbetween to the exercise sequence to slow down the arm movement at the lower end of the cycle, between frame 3 and frame 4.

You'll display frame 3 and select INSERT TWEEN. Frame 4 will become frame 5 and a new frame 4 will be displayed. On this newly inserted frame the entire image from frame 3 — not just the changes — will be shown in dark blue and the entire image from the new frame 5 will be shown in dark green. Using the preceding and succeeding positions as references, you'll draw an intermediate position for the upper body and arms. The rest of the figure will be added later.



Frames 3 and 5 on Inserted Frame



Inbetween Drawn on Frame 4

## Inserting an Inbetween

Continue from the previous exercise, or type FRY and reload GUY02.FLI and GUY.MSK.

Make sure white opaque ink, the draw tool, and a size 2 brush are selected, and the key color is the medium gray of the background.

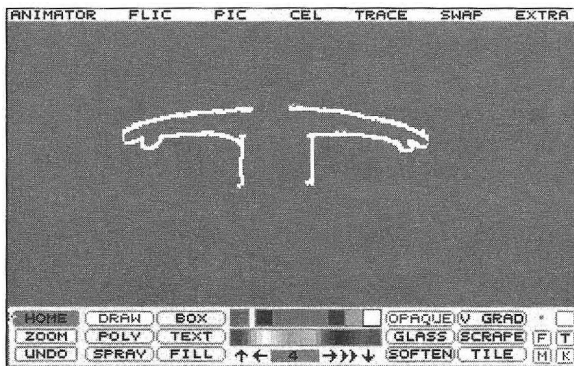
Make sure the color in the left-most slot of the mini-palette is dark blue and the color next to it is dark green.

Display frame 3.

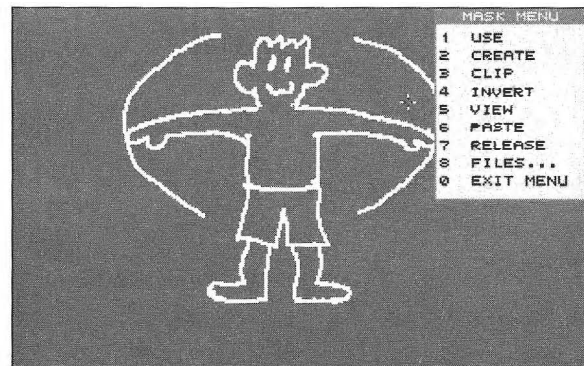
- Open TRACE Select INSERT TWEEN** Displays frame 3's image in blue and frame 5's image in green on newly inserted frame 4.
- Use DRAW** Sketch new upper body with arms in position between that of frame 3 and frame 5.

### Erasing Guides

Once you've drawn the inbetween, you no longer need the other images as references. Unlike NEXT BLUE, these images are not automatically removed when you move on. To turn both images to the key color simultaneously, select ERASE GUIDES from the TRACE menu.



Before Pasting Mask



After Pasting Mask

After removing the guides, you'll see that only the new portion you drew remains. The rest of the body is not yet drawn. You could have traced over the rest of the body before removing the guides. However, you've created a mask of the rest of the body and the motion paths, so you can simply paste the mask onto the frame.

You'll paste the mask onto frame 4 in white ink, in the following exercise. If the [M] button is highlighted, the mask is still in effect. You have to turn it off before you can paste it. (If you took a break or did something that cleared the mask buffer since the previous exercise, you can load the mask file, GUY.MSK, first and then paste it.)

---

## Removing Guides and Pasting the Mask

Open **TRACE** Select **ERASE GUIDES**      Removes all but new drawing.

Right click **[M]** button      Displays **MASK** submenu.

Make sure mask is turned off — no asterisk should appear beside **USE**.

Select **PASTE**      Pastes mask to frame 4.

Right click **screen**      Returns you to home panel.

Play the flic and then save it again, this time as **GUY03.FLI**.

---

Notice that the motion paths are now white in the new frame 4, because they were part of the pasted mask.

This is a good spot for a break, if you like.

## Multiple Movements

So far, you've drawn a sequence in which nothing but the upper body of the figure moves. Consequently, you were able to copy the rest of the figure to the other frames and keep the same mask in effect for each drawing.

When several parts of the body move in one sequence, the animation becomes much more complex and demands careful planning. A good way to do this is to sketch out key poses on a storyboard. Short of that, you need to make major decisions about what goes up and down, what impinges on something else, where and when. In the most basic sense, you should figure out what you want the character to do in the sequence. Then, if you're more comfortable drawing straight ahead than working from key poses, you know where all the parts are going.

Suppose that the head, arms, and legs of a dancer are all moving. Experienced animators approach drawing such a sequence in an organized fashion — perhaps drawing the head positioned in the key poses first and then all the inbetween positions of the head; next the torso and arms, following the changes in the head positions; and so

on, working down to the feet. Lowering the head lowers the shoulders, a hand on one hip balances the opposite leg turning out.

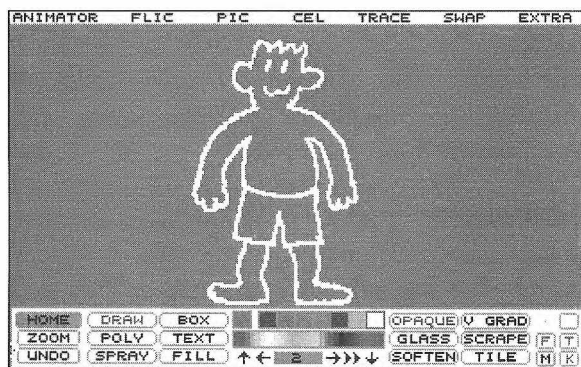
**TIP** *More interesting animation results from timing motions so that the parts do not all move the same way or in lock-step. Superman's cape starts furling back slightly before he leaps forward.*

You can still use NEXT BLUE, INSERT TWEEN, and the other blueing and unblueing functions to draw a sequence containing multiple movements. Also, you may be able to make cels of arms or legs and move them into new positions, rather than drawing them again.

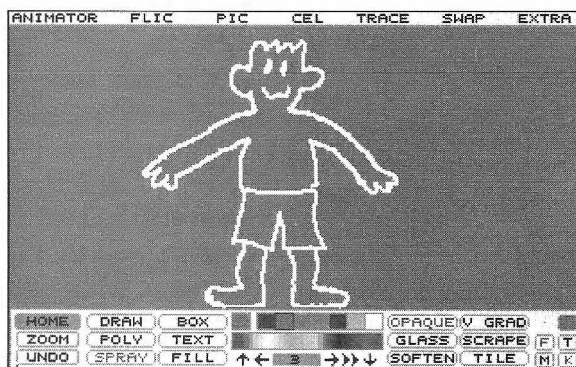
To see how to draw more than one movement at a time, you'll use the next exercise to redo the cycle so that the knees bend at the same time the arms move. The head lowers and the shoulders and arm positions follow as the knees bend. Frame 1 doesn't change. Notice in the following illustrations that the waistline of the swimsuit adjusts to the changes in the level of the torso and legs.

First, you'll remove the orange motion paths by changing them to the gray background. Don't worry about the white motion paths on frame 4, because you'll delete and replace frames 2 through 6. You can change all the orange paths at once. To do this, you'll select the gray background color, turn on the [T] button, select SEPARATE from the PIC menu, and click on the orange color on screen. The time select panel appears and when you select RENDER, all orange is changed to gray on all frames.

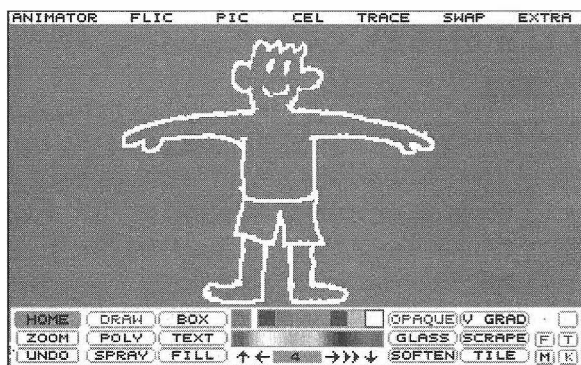
Frame 1 remains as it is. After changing frame 7 to match the illustration, using a cel to copy the upper body, you'll have two key poses ready, the first and last. Then, you'll make a cel of the head, so you can paste it where it belongs on each changed frame of the cycle. You can then delete the old intermediate frames and use INSERT TWEEN to create the new ones. The frame numbers will change throughout the exercise as frames are deleted and inserted.



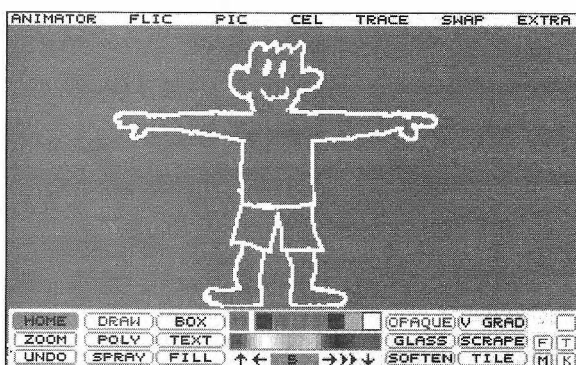
Frame 2 Revised



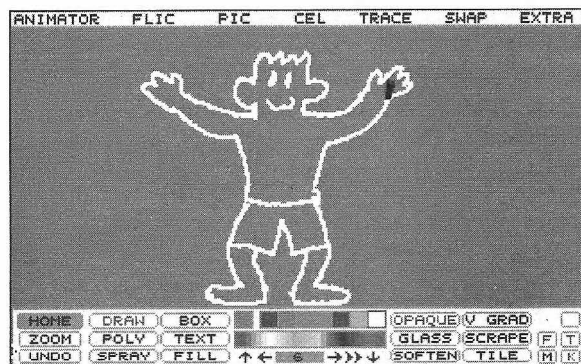
Frame 3 Revised



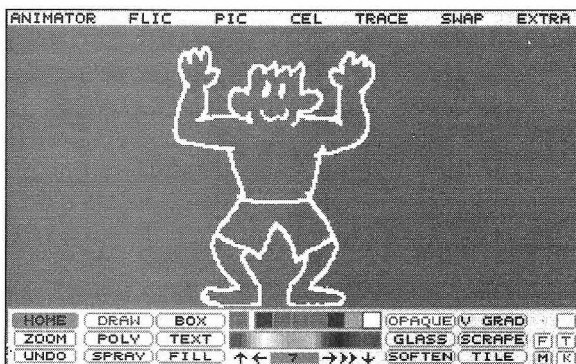
Frame 4 Revised



Frame 5 Revised



Frame 6 Revised



Last Key Pose Revised



---

## Tweening Movements

Continue from previous exercise or reload GUY03.FLI.

Click [T] Turns on time select button to apply SEPARATE to all frames.

Click key color

Open PIC Select SEPARATE The default is to replace a single color.

Click screen Select orange of motion paths; time select panel appears.

Click RENDER Changes orange to gray background everywhere in flic.

Click [T] Turns off time select.

Click down arrow frame icon Displays frame 7.

Press <esc> Make cel of figure from the waist up.

Use DRAW Erase all but feet with key color.

Type ` Move cel down so top of head is where ears were and paste.

Use DRAW Draw lower body for last key pose in white.

On frames panel, display frame 2, delete five frames, display frame 1, and return to home panel.

Press <esc> Make cel of head.

Open TRACE Select INSERT TWEEN Inserts new frame 2, which will be final frame 5.

Paste cel of head and draw rest of middle key pose.

Open TRACE Select ERASE GUIDES

Create one more inbetween for new frame 3 (final frame 6) as illustrated, then move back to frame 1 and create inbetweens for final frames 2, 3 and 4.

Save the flic as GUY04.FLI.

---

If you try these movements in front of a mirror, you'll probably observe other, more subtle changes. Your head may shift left and right, it may come forward, and your facial expression may change. Full animation would show all these movements.

**TIP** *Experienced animators may want to do key poses in pencil and scan them in, drawing inbetweens in Animator. Although the line quality of the inbetweens won't resemble that of the pencilled poses, this technique can work for tests. Also, if the inbetweens can be constructed out of cels taken from the pencilled poses, the disparity in line quality may be overcome.*

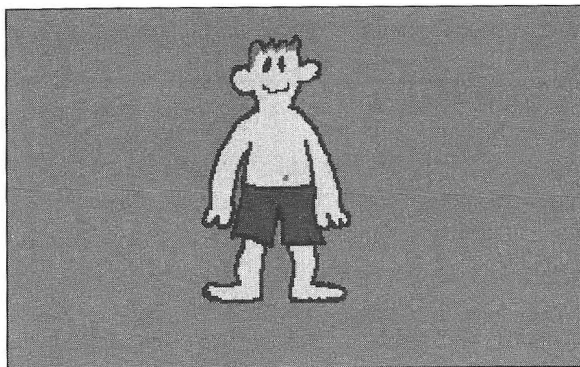
## Filling in the Outlines

The figures you've drawn in the preceding exercises are in outline, all in one color. Now you can color in the outlines. You'll frequently find you are manually applying colors and inks to each frame. This is true for even the most expensive systems.

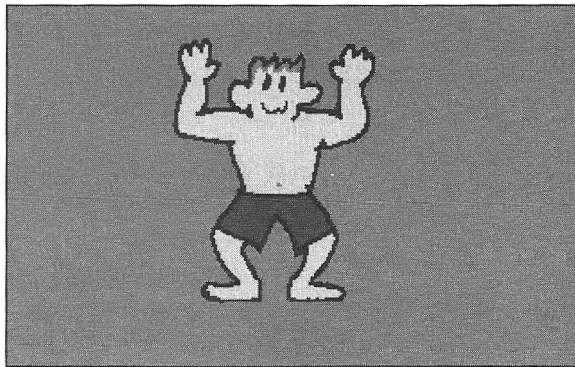
Some operations can be applied to all frames when the [T] button is on. For example, you just removed all the orange at once. You can emboss or unzag all the frames by selecting APPLY INK on the PIC menu while the [T] button is on. Many of the changes you can make to the palette, such as tinting, can be applied to all the frames.

### *Adding Color*

In the next exercise, you'll paint the figure in the flic, GUY04.FLI. You'll use the separate tool to outline it the figure in black on all the frames at once. Choose a black, but not the black in register zero (the default key color slot) of the color matrix. The slot next to register zero, slot 2 on row 1, is a good choice. You'll need to use register zero as the key color when compositing this flic later in Chapter 13, so the key color should not be used to draw the image.



Frame 1 of GUY05.FLI



Frame 7 of GUY05.FLI

You'll have to do the rest of the painting frame by frame. A good skin color is located in slot 52 of the default palette. The hair color in the illustration is in slot 189. You can adjust the RGB or HLS values to make colors you prefer. You should put the colors you're using in the mini-palette for convenience. The belly button is optional; try placing it so that it goes up and down along with the knee bends.

---

## Adding Color

Continue from previous exercise or load GUY04.FLI.  
Turn [T] button on.

On palette panel, replace colors in mini-palette with the colors described above, then return to home panel.

Click <b>black</b>	Select the new black, not the key color.
Open <b>PIC Select SEPARATE</b>	Applies separate function to all frames with [T] on.
Click <b>screen</b>	Select white anywhere on screen. Displays time select panel.
Click <b>RENDER</b>	Replaces white with black in all frames of flic.
Use <b>FILL</b>	Color skin, bathing suit with appropriate colors on each frame.
Use <b>DRAW</b>	Draw hair and, if you like, belly button.

Save the flic as GUY05.FLI.

---

**TIP** *It is possible to draw straight ahead with solid figures, rather than outlines, coloring the images at the outset. When you select NEXT BLUE, the changes are filled in with the blueing color, as in the illustration. This technique works best when the changes between frames are quite distinct. Using INSERT TWEEN with solid figures is not recommended, because it's visually confusing.*

## Adjusting Timing

In addition to cushioning a sequence by inserting inbetweens, you can adjust the timing by duplicating frames that do not change. As described in Chapter 7, you can add pauses and slight syncopations to produce the temporal effect you want.

**TIP** *If you're going to paint the images, it's more efficient to do so first. Then any duplicates are already painted.*

The cycle you've created has all its component positions now. But at the beginning of the movement, the guy looks as if he's flapping his arms. In the next exercise, you'll add a duplicate of frame 1 to alleviate this impression. Then you'll paste a copy of one of the mid positions after the last frame to ease the return to the first position when the

flic is played through several times. Setting the play speed to 10 will also make the motions seem less frantic.

---

## Adjusting the Timing

Continue from previous exercise, or reload GUY05.FLI.

Display frames panel.

<i>Press up arrow key</i>	Displays frame 1.
<i>Click INSERT</i>	Inserts duplicate of frame 1 as new frame 2.
<i>Drag play speed slider</i>	Set play speed to 10.
<i>Drag frame slider</i>	Jump to frame 5.

Return to home panel.

*Type sc* Copies frame 5 to swap buffer.

Jump to frame 8 and insert a new frame after it.

*Type st* Trades image from swap buffer.

Save flic again under same name, GUY05.FLI.

---

The version of the flic you just saved is also on the IN DISK as IN08GUY5.FLI. It's the basis for more figures you'll draw in this chapter and combine into a group in Chapter 13.

## Recycling Characters

Having created a cycle, one way to use it again is to alter the character. The illustration at the beginning of this chapter shows variations you can quickly achieve by changing a color or adding a pattern to the original character. You can also take individual frames from a cycle and use them again as elements. This section demonstrates how to recycle the GUY05.FLI flic to make other parts of the Club Baltic animation you'll put together in later chapters. First, you'll create a variation of the exercise cycle featuring a female character. Then you'll transform the first frame of the cycle into front and back views of the two characters dressed up for the evening activities at Club Baltic.

### ***Cloning a Companion***

The next exercise shows how to transform the fellow into an equally tireless female companion. A different hairdo, a minor costume adjustment, and presto. As you can see in the illustrations, she's been cultivating her tan a bit longer.

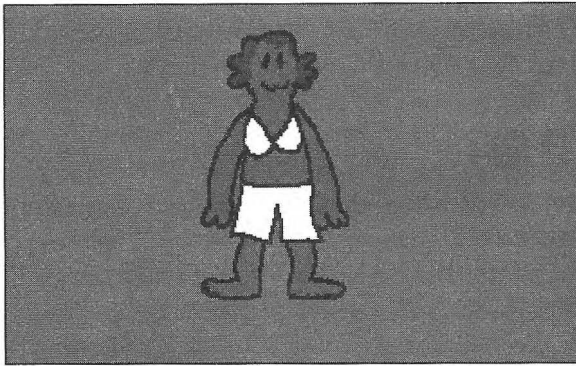
Set up the mini-palette with the colors you'll be needing. A deeper skin color is in slot 200 on the color matrix, the ninth slot in row 7. You might make her hair the color in slot 23 of row 5. Choose a color for her bathing suit that shows off her tan.

You'll use SEPARATE on the PIC menu again to change the skin color. To change the guy's bathingtrunks into a moderately stylish feminine outfit, you'll sketch a top in the black edging color you used when coloring the guy and use the fill tool to color in both top and bottom.

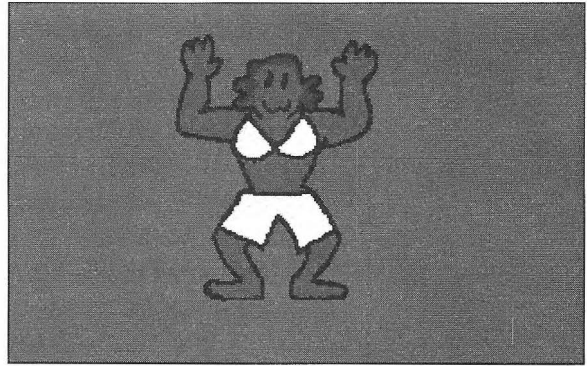
### ***Copying the Hairdo by Clipping Changes***

To avoid having to redraw the hairdo on each frame, you can draw it once and copy it to the other frames by selecting CLIP CHANGES on the TRACE menu. CLIP CHANGES makes a cel of only the changes to a frame. It's like clipping what would be captured by NEXT BLUE. You can then position and paste the cel individually on each of the frames in the flic.

Changing the hairdo quickly is accomplished by drawing a bouffant coiffure — making sure to cover the ears — and pasting it on each frame. Instead of sketching the hairdo, you'll select the shape tool and turn on 2 COLOR. When you draw a shape in two colors, the fill color is the current color and the edge is the color in the far right slot of the mini-palette. So if the black edging color is not in the far right slot, you'll need to put it there before using the shape tool. The trick to using the shape tool is to not release the button until the entire shape is outlined. When you release the button, the shape is closed and filled in one step. For more artistic results (with greater effort), you may choose to use the draw and fill tools instead.



*Frame 1 in Female Version*



*Frame 7 in Female Version*

---

### Presto Change-O



Continue from previous exercise or load IN08GUY5.FLI from IN DISK.



Continue from previous exercise or load GUY05.FLI.

Make sure frame 1 is displayed, the gray background is the key color, and the [T] button is on.

Type **sc**

Copies frame 1 to swap screen.

Set up mini-palette with deeper tan color and colors for hair and bathing suit you want to use.

Make sure black color from matrix slot 2 (register 1) is in far right slot of mini-palette.

Click **mini-palette**

Select deeper tan color as current color.

Open PIC Select **SEPARATE**

Click **screen**

Select guy's skin color to replace it with deeper tan color; time select panel appears.

Click **RENDER**

Changes guy's skin color to gal's on all frames.

Click **[T]**

Turns off time select button.

Set brush size to 2.

Draw top of two-piece bathing suit in black and fill both pieces of suit with chosen color on each frame of flic.

Display frame 1.

Replace spray tool with shape tool and click on 2 COLOR on drawing tools panel.

Click **mini-palette**

Select hair color as current color.

Use **SHAPE**

Draw outline of flattering coiffure covering ears; when you release button, outline color becomes the black in far right mini-palette slot and fills with current color.

Open **TRACE** Select **CLIP CHANGES**

Clips only hairdo as a cel; changes to bathing suit were made before displaying frame 1 again.

Press right arrow key

Displays frame 2.

Type `

Move cel of hairdo into position and paste.

Repeat pasting hairdo on each remaining frame.

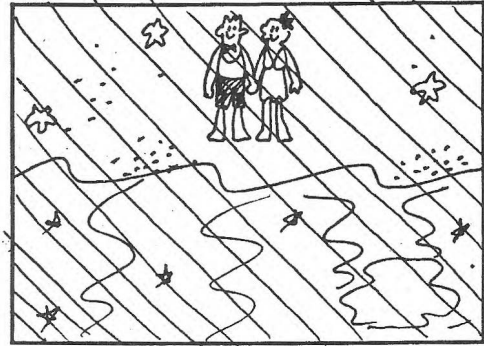
Play flic and save it as GAL.FLI

---

**TIP** *After creating any flic, you may decide to alter two or three elements. It's more efficient to make the first change on all the frames, go back and make the second change on all the frames, and so on, rather than making all changes at once on each frame. You may also see opportunities for macros if you stick to making one change at a time throughout.*

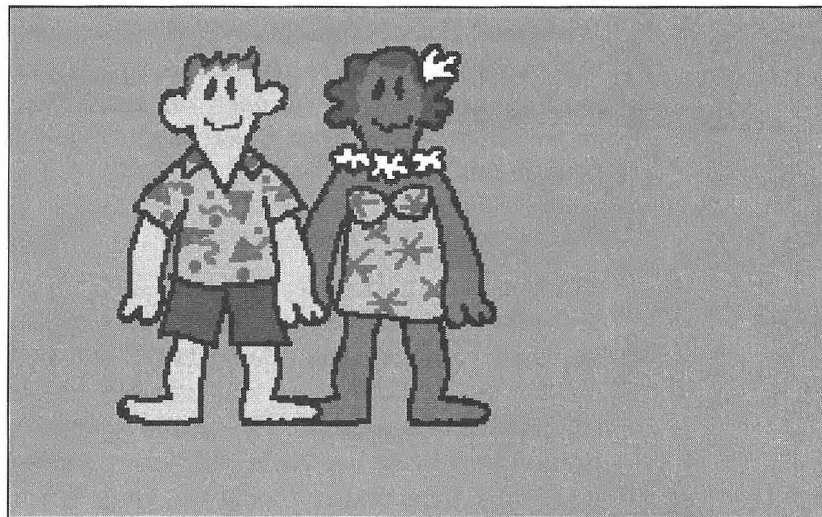
### ***A Couple of Characters***

At two places in the storyboard for the Club Baltic animation, the guy and gal you've animated in this chapter appear as a couple. Their first appearance is with their backs to the screen in the fantasy sequence on the beach at sunset, which you'll prepare in Chapter 10 and composite in Chapter 13. The second appearance is near the end of the animation, just before the scene flips up and turns into the Club Baltic logo. This time they're facing the viewer. You'll flip the scene up in Chapter 12. In both cases, the images are still pictures, requiring no changes of position, only a quick costume change.



*Two Views of Couple in Storyboard*

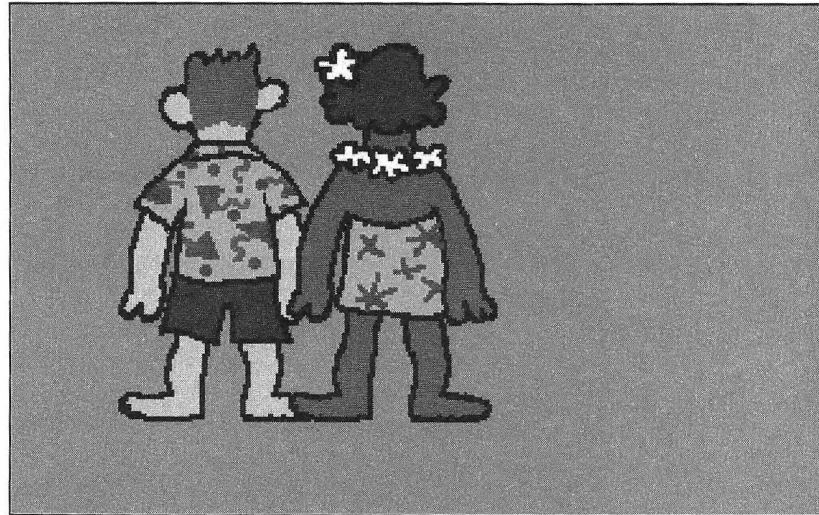
To prepare these drawings, you'll paste the guy from the first frame of GUY05.FLI onto GAL.FLI and make appropriate changes to the front and back views of the couple. The gal in the illustrations is wearing a snazzy sarong, hibiscus flowers as a necklace and hair ornament. The guy has put on a brightly patterned shirt. You can opt for simpler garb and choose the colors you prefer.



*Front View of Couple After Costume Change*

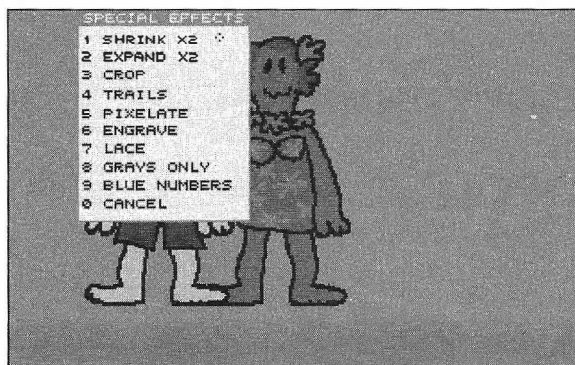


As the illustrations show, the back view is accomplished with a few strokes of the draw tool and the fill tool. You just need to fill in the hair on the back of the heads and make slight changes to the shirt and sarong.



*Back View of Couple After Costume Change*

Then, you'll shrink the front view of the couple to one-quarter the original size. To do this, you'll select EFFECTS on the FLIC menu and select SHRINK X2. Don't save any changes to GAL.FLI in the following exercise, since you'll need to use it again as it is now.

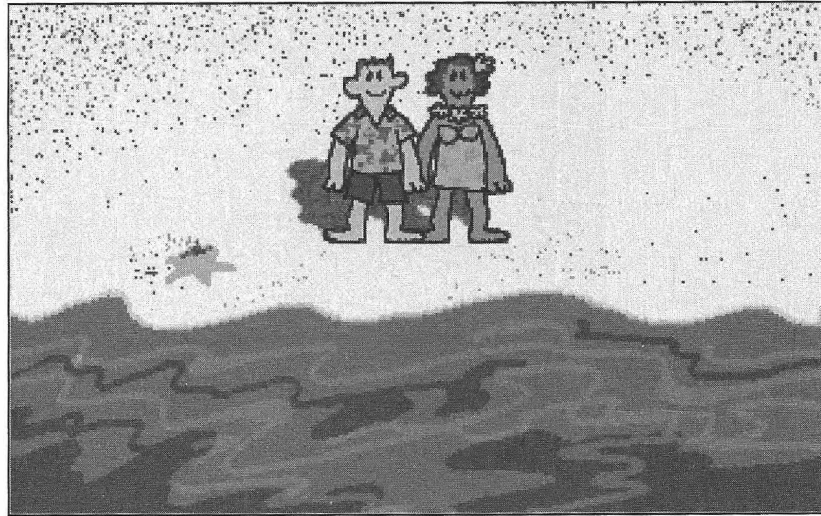


*Special Effects Submenu*



*Shrinking the Picture*

Finally, you'll sketch a simple background of sand and water, with at least one starfish on the beach, and paste the couple as a cel on it. This background will be used again in Chapter 13. The sand and starfish may be any color you choose, but the water must be the blue color in row 4, slot 16 (source 111) of the color matrix for compositing later. If you have the IN DISK, you can load a more detailed background from the file IN08BECH.GIF.



*Front View of Couple on Beach Background*

---

### Changing Costumes

Make sure key color is gray background color, frame 1 of GAL.FLI is displayed, and frame 1 of GUY05.FLI is on the swap screen.

<i>Type st</i>	Trades picture on swap screen (frame 1 of GUY05.FLI) for picture on main screen (frame 1 of GAL.FLI).
<i>Press &lt;tab&gt;</i>	Clips cel of guy.
<i>Type st</i>	Returns gal to main screen.
<i>Type `</i>	<i>Position</i> guy on left side of gal and paste.

Use SHAPE and/or DRAW and FILL to change gal's bathing suit to a dress and add flowers.  
Use SHAPE and/or DRAW and FILL to put a shirt on the guy.

<i>Type sc</i>	Clips to swap screen.
----------------	-----------------------

Use SHAPE and/or DRAW and FILL to change gal's head and dress for back view, as illustrated.  
Use SHAPE and/or DRAW and FILL to change guy's head and shirt for back view, as illustrated.  
Save this view of couple as BACKVIEW.GIF.

Type **sp** Pastes front view of couple from swap screen.  
Open **FLIC** Select **EFFECTS** Click on SHRINK X2 on SPECIAL EFFECTS submenu.

Before clipping the cel, position the cursor between the couple and press <F1> to check that surrounding background is still same slot as key color. If <F1> doesn't highlight the key color slot, click between the figures to fill the surrounding background with the key color.

Clip image as cel and save as COUPLEF.CEL.

Type **x** Clears screen.



Load IN08BECH.GIF.



Use DRAW and FILL to draw line to mark off sand from water and fill each area with color. For water, select slot 16 in row 4, of color matrix. Draw a starfish on lower left of beach. Save as BEACH.GIF.

Type **`** Position cel of couple on beach as illustrated, and paste.

Save as COUPLEF.GIF

---

**NOTE** *SHRINK X2, and similar effects, may sometimes change a color without it being apparent. In the above exercise, the background grey key color surrounding the couple may change imperceptibly to a gray from a different slot of the color matrix. If so, you have to change it back to the key color or it won't paste correctly.*

In Chapter 10, the back view of the guy and gal will be shrunk and clipped as a cel, using the technique you just used for the couple facing front. The back view of the couple will then be incorporated into the color cycled sequence that opens the Club Baltic animation.

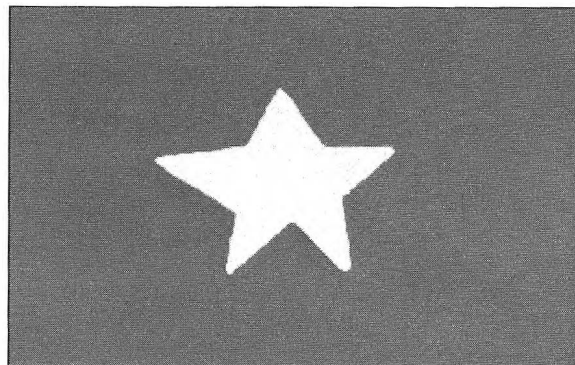
## Recapping a Cycle

Now that you know how to draw a cycle, you can quickly make one for the starfish that falls off the beach as its frame spins up at the end of the Club Baltic storyboard. The starfish lands on its feet, so to speak, and immediately goes into its own aerobics routine. This last exercise is optional.

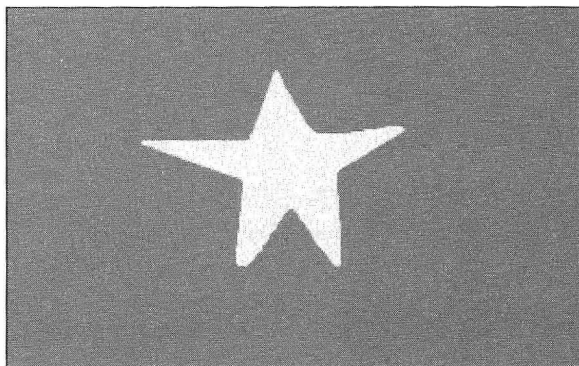
Three positions drawn straight ahead are sufficient to suggest the more limited movements a starfish might make if a starfish felt like stretching and flexing its muscles. Just take your cue from the illustrations. In the first position the figure is at rest, in the second position it is stretched up, and in the third it is squatting and flexing.



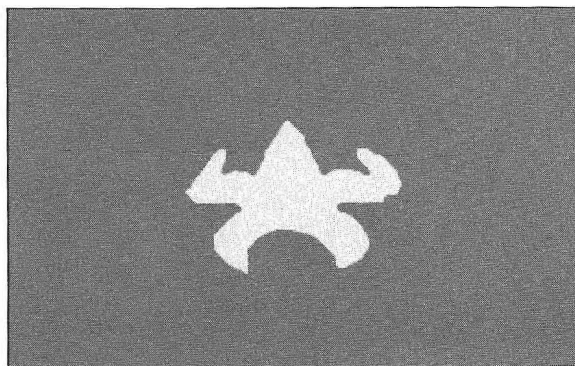
*Last Frame of Storyboard*



*Starfish's First Position*



*Starfish's Second Position*



*Starfish's Third Position*

The final exercise in this chapter shows you how to draw the three positions for the starfish's cycle using NEXTBLUE. First, you'll fill the background with a darker shade of the starfish's color that works well to smooth the edges of the starfish. After three frames are drawn, you'll change the background to the default black key color in register zero, for compositing the starfish in Chapter 13.

**TIP** *Before softening or unzagging an image that you will later composite, change the background color to a slightly darker shade of a color used in the image, rather than the default black key color. Softening or unzagging with a black background puts an uneven black edge on the image that is usually undesirable.*

In the following exercise, you can use the draw and fill tools to draw a starfish with a personality. Or if you just want to draw it quickly, you can use the shape tool to draw and fill the starfish in one operation.

---

## Animating the Starfish

Type **fry**

Set both current color and key color to a darker shade of the color you'll use for the starfish.

Type **pa** Fills background with color.

On frames panel, make three frames, set play speed to 10, and return to home panel.

Click **mini-palette** Select starfish's color as current color.

Use SHAPE with 2COLOR off or DRAW and FILL to draw first position on frame 1 with one-pixel brush, as shown.

Open **TRACE** Select **NEXT BLUE** Puts blued image of starfish in first position on frame 2.

Draw second position on frame 2, repeat NEXT BLUE, and draw third position on frame 3.

Open **TRACE** Select **UNBLUE FRAME** Erases blued image on frame 3.

Click **[T]** Turns time select on.

Click **SOFTEN** Use APPLY INK on the PIC menu and RENDER on time select panel to soften the image on all three frames.

Select default black key color as current color and OPAQUE as current ink.

Open PIC Select **SEPARATE** Click background color and render black key color on all three frames.

Play flic and save as STARFISH.FLI.

---

**TIP** *NEXT BLUE erases the blued image, restoring the previous colors of the frame before it leaves it. However, UNBLUE FRAME replaces the blued image with the key color. To unblue the last frame in the same manner as NEXT BLUE, as you might need to do to restore a complex background, make an extra frame, use NEXT BLUE instead of UNBLUE FRAME, and then delete the extra frame.*

If you choose to complete the Club Baltic animation, you'll shrink the starfish and composite it in Chapter 13.

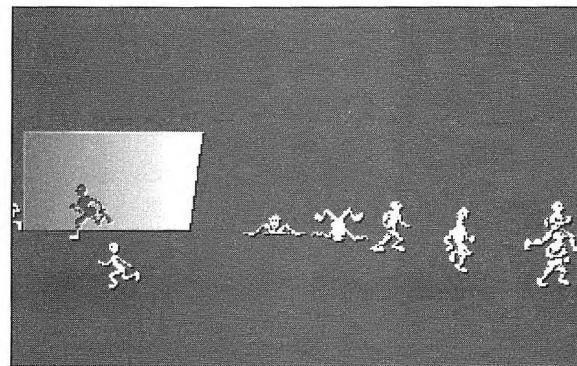
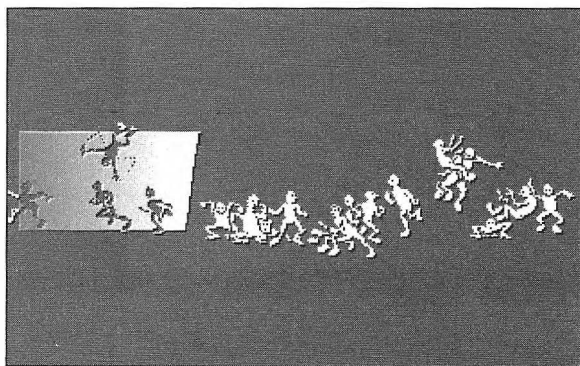
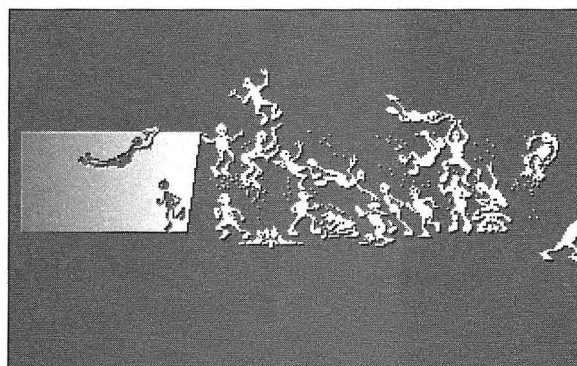
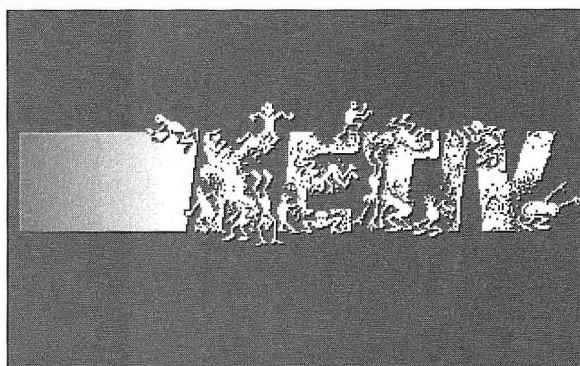
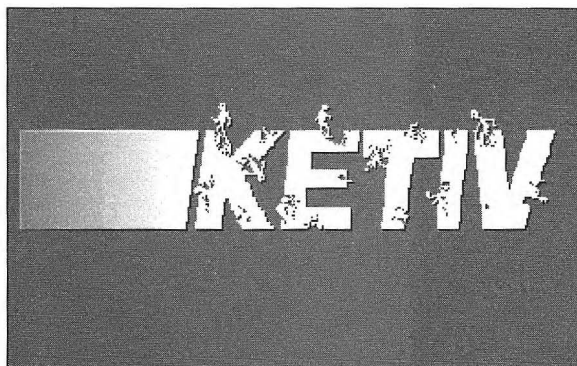
**NOTE** *You may now delete the GUY01.FLI, GUY02.FLI, GUY03.FLI, and GUY04.FLI files since we will not be using them again.*

## Other Examples

David Nilsen of Ketiv Technologies has provided the two examples in this section. The first is six frames out of seventy from his animation called Quitting Time, which captures the collective urge to escape the confines of work at the end of the day. The second is six frames from Nilsen's Robotruck animation, a visionary solution to the traffic problem.

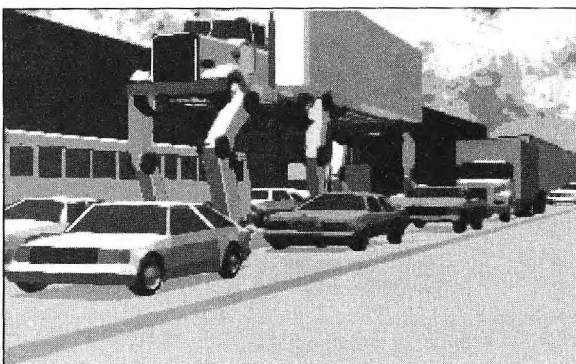
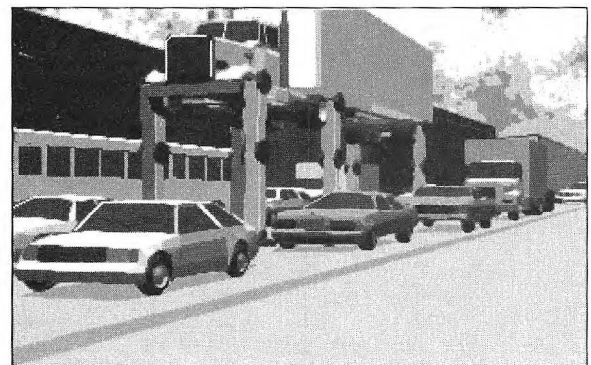
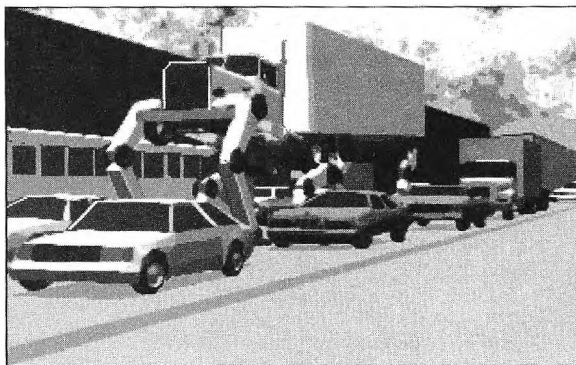
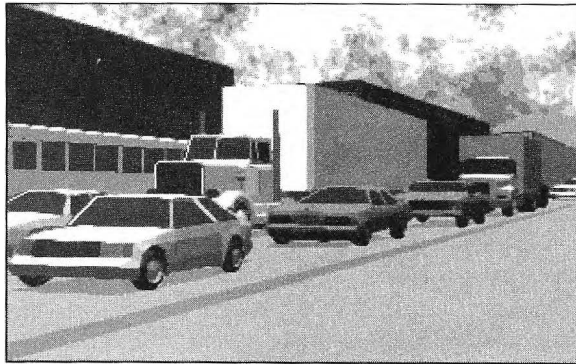
The playful spirit of Quitting Time has been achieved by drawing straight ahead. Nilsen did not start out with a formal plan; the flow of the design emerged as the little men emerged. At the beginning, each frame was drawn and the changes made by hand. Later, cels of individual figures formed a cycle of four or five positions which were repeated with variations. When the drawings were completed, the figures were softened and embossed, which enlarged them slightly.

Robotruck is, of course, an example of a walk cycle. Each frame was drawn in AutoCAD, rendered in AutoShade, and brought into Animator with the Flimaker utility program.



*Quitting Time*





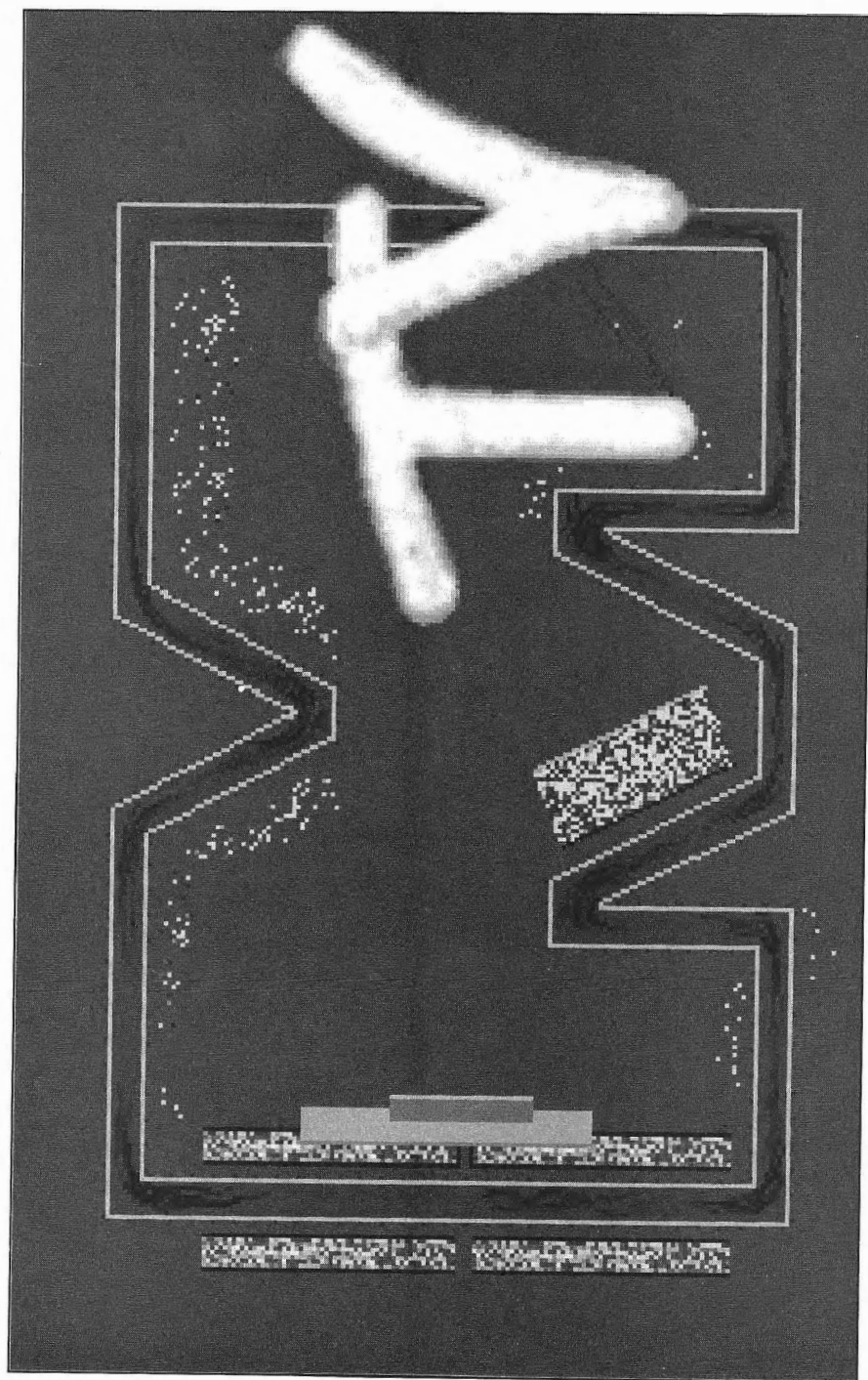
*Robotruck*



## Next Steps

Classic animation is a subject on which many books have been written. This chapter has shown you how to get started, using Animator. On the fundamentals of character animation, two books are excellent resources: *The Animator's Workbook*, by Tony White (Watson-Guptill) and *How to Animate Film Cartoons* by Preston Blair (Walter T. Foster).

In Chapter 9, you'll fashion two titles for the Club Baltic animation that you'll composite with the exercise cycles in Chapter 13. The metamorphosis you create in Chapter 11 will also be composited with the exercisers. Chapter 10 uses the couple viewed from the back, and Chapter 12 uses the front view of them. At the end of Chapter 13, you'll combine the starfish with the Club Baltic logo.



*A Fresh Perspective on Tiltling*

# Words Processed as Images

Because titles often have the first and last word, as well as a few choice words in between, it's a challenge to make them interesting or even arresting graphic elements. You probably recall the opening credits of some films, such as the Pink Panther series, in which the titles were especially memorable. Or a television program you watched regularly, perhaps the one where the letters were stenciled to look like an official military stamp spelling out M-A-S-H.

To create effective titles, give them the same considerations at the planning stage you give to other moving elements in your layout. Where does the title first appear, where does it go? How does the title relate to the rest of the elements?

At the same time, you need to take into account questions that arise only in connection with titles. Which font best suits this animation? If there is body copy, how does it fit with headlines? How long should a piece of text be on screen for people to read it? These and other questions arise in recognition of a title's dual purpose: to be both graphic and legible.

Variety is important. Titles can — and should — overlap other elements, encroaching on patterns and photos. Titles need not always sit over blank backgrounds, wrapped only in their shadows. Scale and contrast can provide drama without compromising legibility. For example, a series of short headlines might each pop on quickly, disproportionately larger than the body text. The body text, in contrast, might scroll slowly up from below the screen while a rectangle slides into place to encase the body text in its final position.

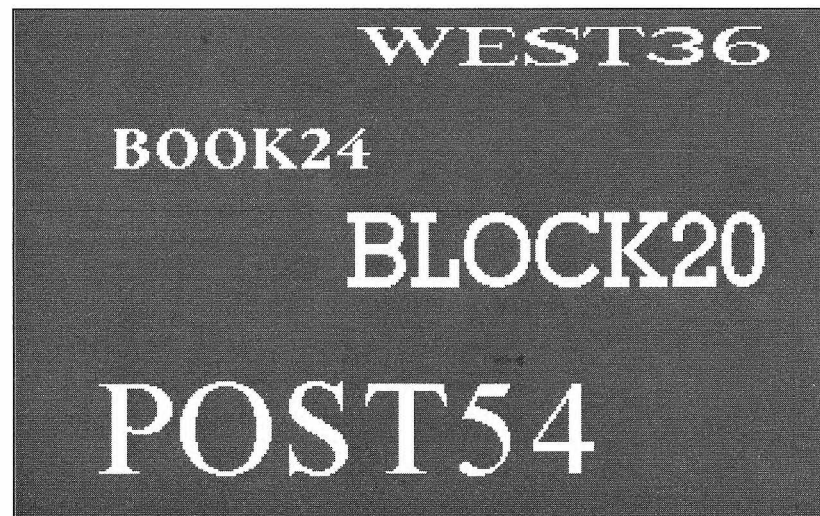
Chapter 6 introduced Animator's text tool and titling panel options for entering text and scrolling it up, down, and sideways. However, there are many other possible ways to animate text without using the titling panel. You can work with text as a cel, color it, animate it frame

by frame, make it fly with optics movements, and so on. Once pasted on a frame, text is an assemblage of colored pixels to be manipulated like any other image.

This chapter demonstrates some of the ways you can create interesting animated titles without using the titling panel. You'll create a piece of text, manipulate it as a cel, process it with several inks, and split it manually frame by frame to give the illusion that it's floating below the surface of the water, rippling gently with the waves. The last step will be to change the color incrementally on each frame with the aid of two macros you build.

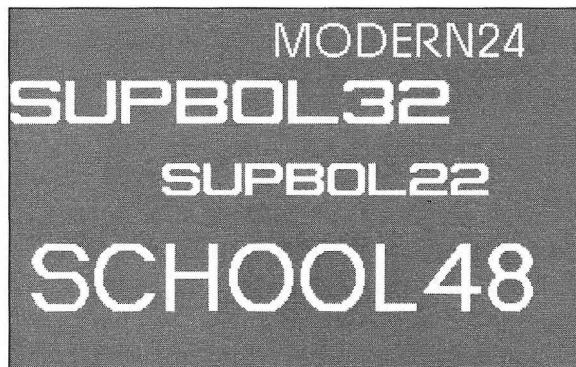
## The Animator Fonts

Animator provides 16 font files with the release disks and over 60 additional font files on bonus disks (sent after you mail in the registration card). Each font file contains all the letters and numbers for one size of a particular style of type; several styles come in a range of sizes. For example, the art deco style comes in two fonts, one twice the size of the other: DECO24.FNT and DECO48.FNT. An uncluttered, utilitarian family of styles comes in two sizes on the release disk, VELVET14.FNT and VELVET24.FNT, with five more sizes on the bonus disks, ranging from VELVET10.FNT to VELVET54.FNT.



*Serif Fonts*

Among the Animator fonts you'll find two classic categories of print typefaces: those with *serifs*, the short lines at the end of strokes, and those without, called *sans serif*. Each font has its own personality. A tall, graceful serif font is POST54.FNT. BLOCK20, in contrast, is squared off, with large, straight serifs. BOOK24.FNT is a chunky, angular serif font, while WEST36.FNT is squat with chunky serifs. Among the sans serif fonts are SUPBOL22.FNT and SUPBOL32.FNT, which are squared off; MODERN24.FNT, which is more slender; all the VELVET fonts; and SCHOOL48.FNT, which is taller than it is wide, with moderately thick strokes.



*Sans Serif Fonts*



*Unconventional Fonts*

The Animator fonts also include unconventional styles for special occasions. For example, ARMY24.FNT might be chosen for the markings on a fighter plane. If you were animating a futuristic mini-epic to introduce a new product, you might select SCIFI32.FNT for the titles. Both SCRIPT24.FNT and QUILL36.FNT look more old-fashioned, like stylized handwriting.

**TIP** *If you're not sure which font you want to load, select FONT from the text tool options on the drawing tools panel, rather than from the titling panel. A sample of the font you've loaded is displayed on the drawing tools panel (if it's not too large to fit) so you can see what you've chosen before leaving the panel.*

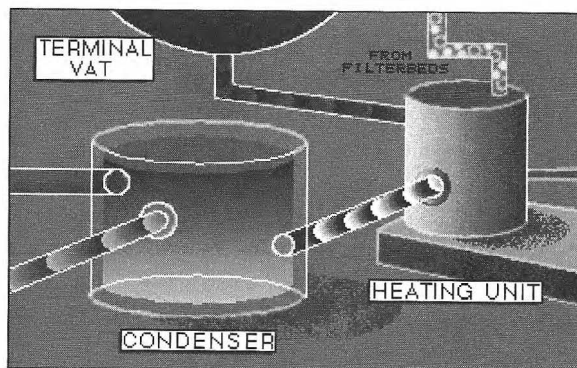
One style may be more effective than another as a design element in your layout. The serif fonts are more legible for body copy, while the sans serif fonts tend to make good headline fonts. Unconventional fonts attract considerable attention to themselves and would not work

in every circumstance; they may be quite appropriate, however, for logos or other display titles. As you saw in Chapter 6, it's simple to select a font at the time you enter text or later to change the font of text that is already entered into the text buffer. Consequently, you can try out different fonts to see which one is most suitable.

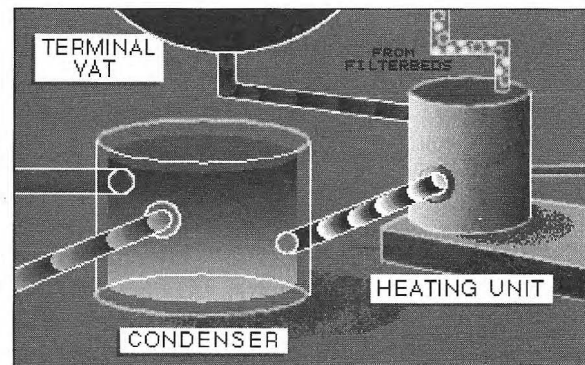
**TIP** *It's possible to bring in titles created with other higher resolution programs. You can't scroll such titles, but you can work with them as cels, process them as images, and perform optics movements on them.*

As in printed works, an abundance of fonts can tempt inexperienced designers to produce a visual cacophony of mixed sizes and styles. A good rule of thumb is to stick with the same font in proportionately related sizes, unless you have a clear reason for changing fonts. For variety or to give emphasis to part of the text, you can vary the sizes, colors, or reverse out letters, while keeping the same font.

Even when a title is in a legible font and carefully placed on screen, other elements can still undermine the title's effect. In the illustration below, the text is encased too tightly in a rectangle that is meant to set it off. Often in technical illustrations you'll see a title — a part label, for example — that looks as if the letters are trying to break out of the rectangular background. The solution is to leave a good margin around the text.



*Title Crowded in Rectangle*



*Title With Adequate Margin in Rectangle*

## Entering and Adjusting the Text

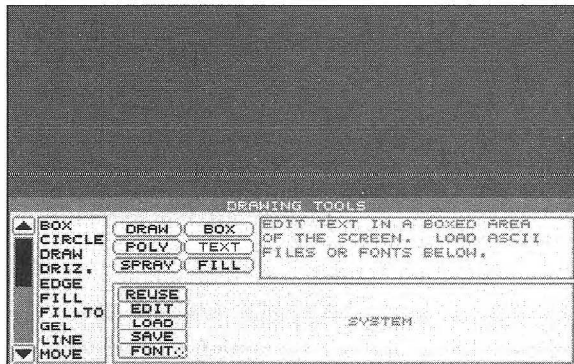
In the following exercises, you'll create two titles that will be used again in Chapter 13, where they'll be composited onto the background of the Club Baltic animation. One title is for the deep-sea fishing sequence and one is for the sequence in which the tennis ball spins across the screen and into the ocean.

You can select any of the larger Animator fonts for these exercises. The SCHOOL48.FNT file on the bonus disk is used in the illustrations and in the IN09TITL.GIF file on the IN DISK. However, if you don't have either disk, you might choose BLOCK20.FNT or POST54.FNT.

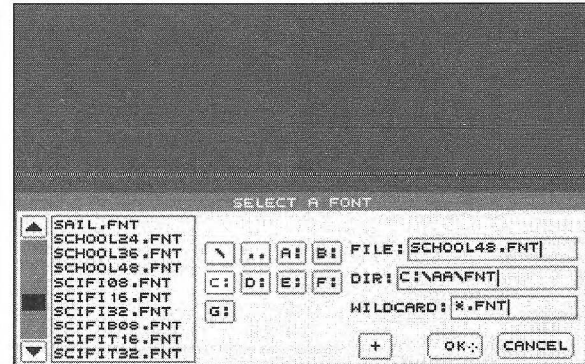
The one-word titles in the following exercises ("FISHING" and "TENNIS"), are both in upper-case letters. Since the titles are to be in the same font, it's efficient to load the font and enter the text for both, then adjust them as needed, and save them as separate cel files.

### Entering the Text

First, you'll set up a vivid blue as the background color, the same blue of the water used in Chapter 8 for BEACH.GIF. Then you'll select one of the light colors in the gray-scale cluster for the text. After setting up the colors, you'll select a font and create the text for each title.



Text Tool's Options on Drawing Tools Panel



Loading a Font

The text tool and its options are more appropriate than the titling panel for this exercise because the results will initially be applied to only one frame. Each word is going to become a cel you can move and reposition later before pasting to all the frames of its sequence.

Therefore, where you place the text on the screen at this point is not important.

---

### Entering the Text



You have IN09TTTL.GIF, so you can skip to the Using Soften and Split Ink exercise.



Do this exercise.

*Type* **fry**

*Type* **@**

*Right click* **mini-palette**

*Click* **color matrix**

*Displays* palette panel.

*Select* dark blue to be changed.

*Select* marine blue in register 111 (slot 16 in row 4) to replace dark blue in mini-palette.

*Return* to home panel.

*Select* marine blue as key color and as current color.

*Open* **PIC** *Select* **APPLY INK** *Fills* screen with marine blue.

*Right click* **TEXT**

*Click* **FONT**

*Displays* drawing tools panel, **TEXT** options shown.

*Displays* file selection window listing font files.

*Load* SCHOOL48.FNT or a font of your choice from the AA directory and *return* to home panel.

*Click* **mini-palette**

*Use* **TEXT**

*Type* **FISHING** <enter> **TENNIS** <up arrow>

*Right click* **screen**

*Select* white as current color.

*Set* corners of editing box to cover most of screen.

*Enters* text for each title on a separate line; pressing up arrow returns first word to editing box.

*Pastes* text.

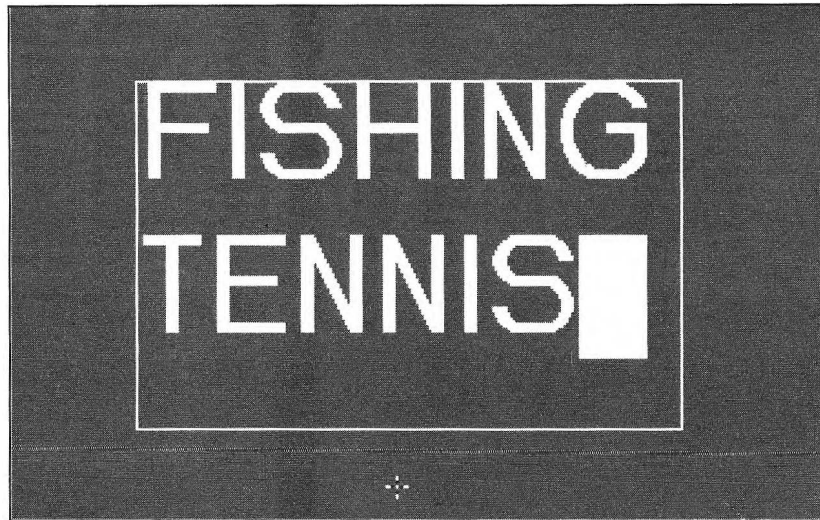
*Type* **sc**

*Clips* copy to swap screen for safekeeping.

---

Both titles should be pasted on screen in the font you selected. Because they were entered in the same editing box, they are both in the text buffer.





*Entering Text for Two Titles*

### ***Adjusting Text With the Move Tool***

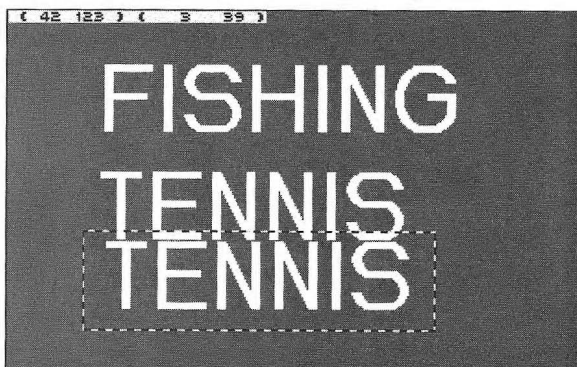
After pasting text on screen, you may want to reposition part of it. Perhaps you want to move just a word or a phrase in a longer piece of text. Or the spacing of letters in the Animator font you've chosen may not quite meet your standards of aesthetics or legibility. You may prefer to lengthen or shorten the distance between two or more letters to suit your eye or to make text more readable.

As you may recall from Chapter 6, you can change the location of text by using the text tool's reuse or edit options to move or resize the editing box. However, these methods move the entire text entry and won't alter text that is already pasted. An alternative is to make a cel of a character, word, or phrase, then move and paste it with the CEL menu options. In Chapter 3, the exercise in which you made cels of the months for the chart and pasted them in place illustrates this basic procedure. This is also the best method for moving text to another frame.

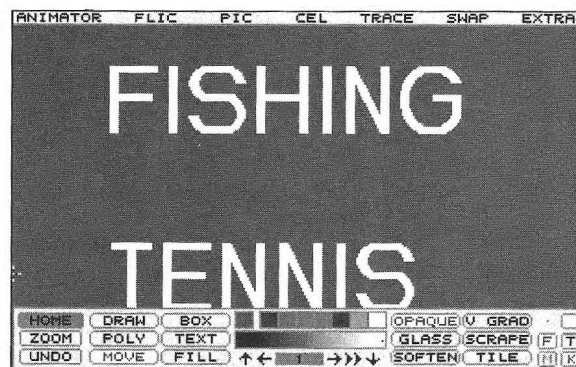
Animator's move tool provides a simpler method for repositioning text on the same frame. With the move tool, you can click to pick up any image in a boxed area of the screen, move it, and click to paste it elsewhere on screen, just the way you move a cel. The area where the image had been is filled in with the key color. In the next exercise,

you'll move the entire "TENNIS" title down to make more room between it and the "FISHING" title.

If you've selected a font in which letters are tightly packed together (like BLOCK20), you can also use the move tool to slightly increase the spacing between letters in the two titles. You're going to distort the letters and split them sideways to create the ripple effect, and unless there's some distance between them, they'll run together and become illegible. Follow your own judgment. You can easily space a group of letters, one letter at a time, and move the same letter again a bit more in either direction. The status line tells you the precise distance, but you can let your eye be your guide.



*Moving the TENNIS Title*



*TENNIS Title Moved Down*

## Adjusting the Text

On drawing tools panel, replace spray tool with move tool and return to home panel.

*Right click screen*

*Use MOVE*

Displays entire screen.

Set corners of box to surround "TENNIS," click to pick it up, move it, and click to set new position.

*Use MOVE*

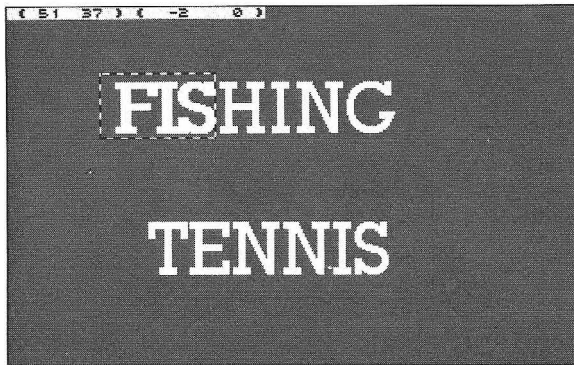
*Use MOVE*

*Separate* letters in "FISHING" if your font packs them too closely.

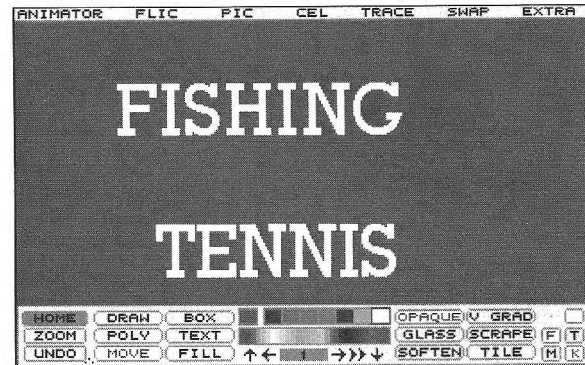
*Separate* letters in "TENNIS" if your font packs them too closely.

Display home panel again.

Save the picture as TITLES.GIF.



Using MOVE Tool on BLOCK20.FNT Spacing



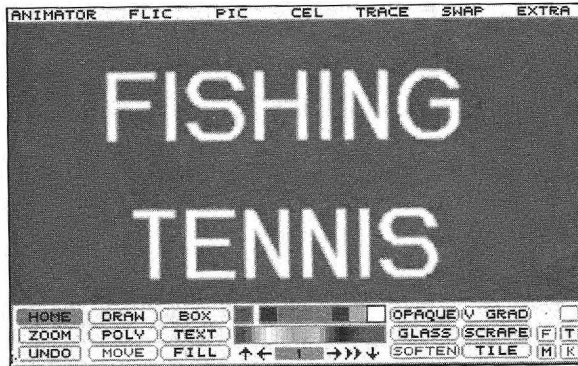
"FISHING" Spaced, "TENNIS" Unchanged

Now that you've entered and adjusted the text for the titles, you need to alter the images so that when you run the flic, they appear to be under water.

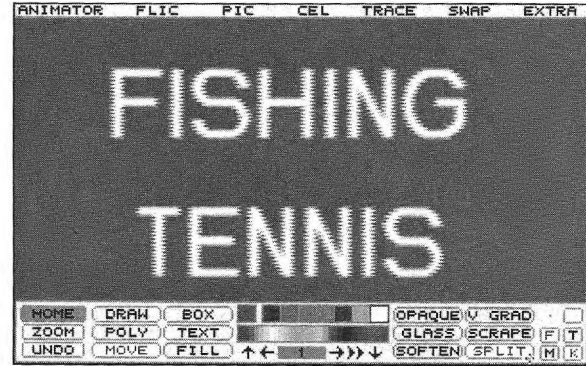
## Processing Text as an Image

Soften ink and split ink can help create the impression that these titles are underwater. Soften ink blends all the edges of an image with the background color. Ordinarily, you would use unzag ink to smooth only the curved and diagonal edges, as described in Chapter 3. However in this instance, the special effect you want requires all the edges to be smoothed; thus soften ink is the one to choose. Split ink moves each horizontal line of pixels in the opposite direction from the preceding line. The offset is the number of pixels you specify with the ink strength slider on the ink types panel. The default setting offsets each line by one pixel. Using soften together with split ink will make the letters seem to blur and start disintegrating in the water. But because of their size, they'll remain legible.

In the following exercise you'll first apply soften ink to the two titles. Then you'll apply split ink to both of them, using the default offset of one pixel. Although the technique for preparing each title is identical, you'll have to create the movements separately for each. Therefore, you'll save each title as a cel.



*Titles After Applying Soften Ink*



*Titles After Applying Split Ink*

---

### Using Soften Ink and Split Ink



Continue from previous exercise or load IN09TTTL.GIF from the IN DISK.



Continue from previous exercise or load the TTTL.GIF picture file.

Click **SOFTEN**

Selects soften ink.

Open **PIC** Select **APPLY INK**

Applies soften ink to both titles.

Replace tile ink with split ink on ink types panel, and return to home panel.

Type **pa**

Applies split ink to both titles.

Open **CEL** Select **GET**

Get cel of "TENNIS" title.

Save the cel as TENNIST1.CEL and return to home panel.

Press **<escape>**

Get cel of "FISHING" title.

Save the cel as FISHINT1.CEL and return to home panel.

---

You can now create the frames for each title animation. In the next section, you'll do so for the "FISHING" title.

## Creating the Movement

The “FISHING” title cel is currently in the cel buffer. After removing the text of the two titles, paste this cel on screen by itself to work on first.

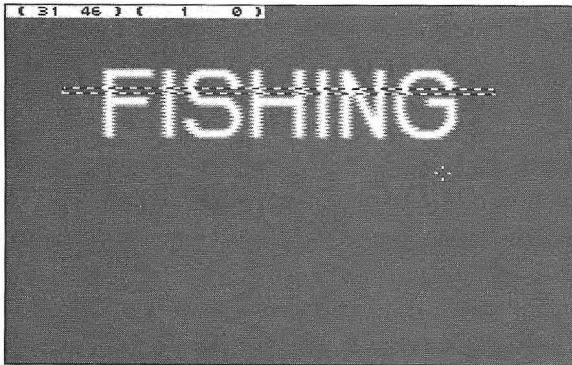
You’ll create four different frames, which will be the core of a cyclical movement for the ripple illusion. You’ll then expand from four to seven frames by adding duplicates.

### ***Making Cel Slices***

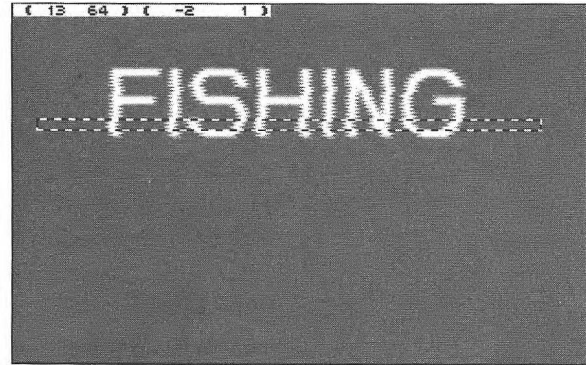
On each frame, you’ll slice an upper cross-section of the image as a cel and reposition it slightly. You’ll take a similar cross-section from the lower part of the title and reposition it. If you reposition the upper cel to the right, move the lower cel to the left. For variety, move one of the cels up or down as well as horizontally. The process is not precise — the changes should appear to be random when the sequence is played. Don’t make the size of your slices the same from frame to frame. The best results occur if you limit moving the cel only one pixel to the left, right, up, or down from its original position.

**TIP** *Many cycles, such as the exercise sequence in Chapter 8, consist of a short sequence that is obviously being repeated from beginning to end. Often, however, you want to disguise the fact that only a few frames produce a movement. Giving the impression that the changes are random helps disguise a repeated cycle.*

In the next exercise, you’ll create four frames of the “FISHING” title. You’ll use CEL GET to slice two cross-sections from the image on each frame and move and paste them with CEL PASTE. Turn off the [K] button before taking the first slice so the key color is not transparent and the cel’s blue background color will fill in the space from which you move the cel. You can try different cuts and moves, restoring the image by clicking UNDO immediately, or by pasting the original cel again. You can also try using the move tool instead of cels for horizontal movements, but it will leave gaps if you use it for up or down movements. White ink should still be selected.



*Taking First Cross-Section of "FISHING" Title*



*Second Cross-Section of "FISHING" Title*

---

## Creating the Movement

Continue from previous exercise, or reload FISHINTI.CEL.

Make sure key color is the blue from register 111 (slot 16 in row 4) of the color matrix, and that white is the current color.

**Type `x`**                      Clears screen.

**Click OPAQUE**

**Type ` Right click screen**    Pastes "FISHING" title on screen.

On frames panel, create three new frames for a total of four, drag play speed slider to 10, and return to home panel.

**Click [K]**                      Turns off [K] button, so key color is not transparent.

**Press <escape>**

**Type `**                      Get cross-section of upper portion of title, as illustrated.

**Click** to pick up, move, and click to paste cel.

**Press <escape>**

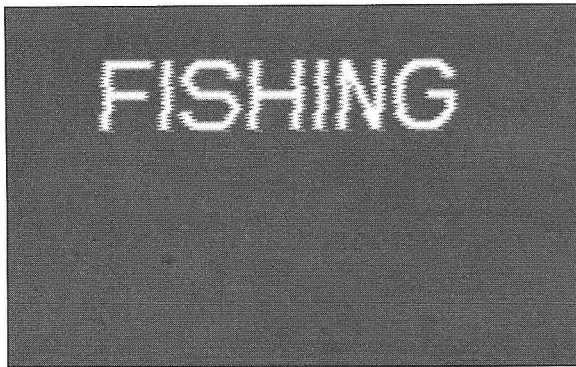
**Type `**                      Get cross-section of lower portion of title.

**Move and paste** cel in opposite direction, as illustrated.

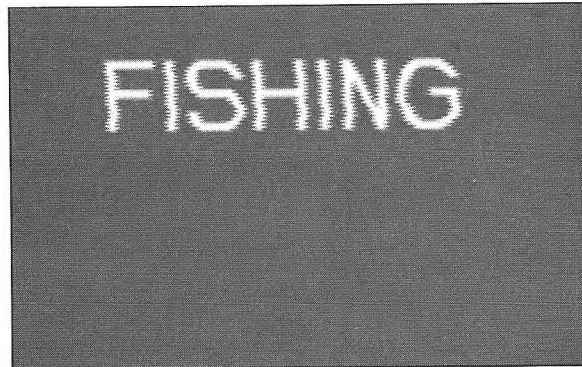
Repeat on frames 2, 3, and 4 taking upper and lower cross-sections and pasting them.

Play the flic and save it as FISHINTI.FLI.

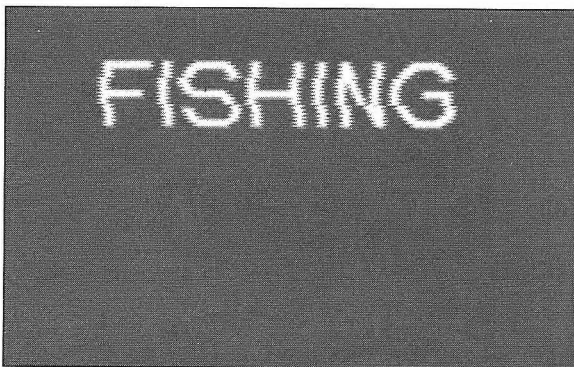
---



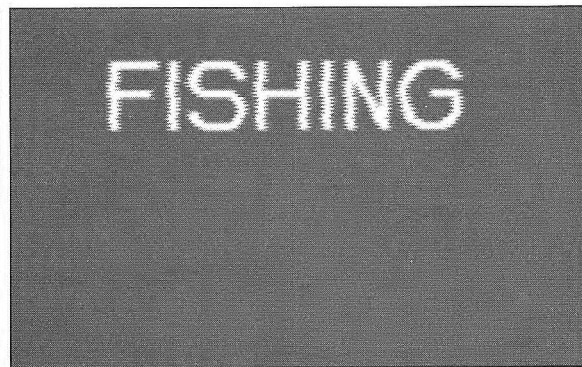
*Frame 1 of "FISHING" After Making Slices*



*Frame 2 After Making Slices*



*Frame 3 After Making Slices*



*Frame 4 After Making Slices*

## Creating More Movement



Skip this exercise — you have the completed TENNIS flic on the IN DISK.



Continue, to prepare the similar TENNIS flic.

Display frame 1 and turn on [T].

Type **x**

Render to clear all frames.

Load TENNISTI.CEL.



Type `` Right click screen` Render to paste "TENNIS" title to all four frames.

Turn off [T].

Repeat the slicing sequence on all four frames, as you did to the "FISHING" title.

Play the flic and save it as TENNISTI.FLI.

---

### ***Duplicating Frames***

If you play the flics now, the movement probably looks jerky. Each flic needs more frames before it will begin to look as if the letters are undulating, waving side to side gracefully. You'll increase the number of frames in the next exercise and duplicate three of the four images. The order of the seven frames will be 1, 2, 3, 4, 2, 3, 4.

---

### **Duplicating Frames**

Load FISHINTI.FLI.

On frames panel, insert three duplicate frames after frame 4 and return to home panel.

<code>Click left arrow twice</code>	Displays frame 2.
<code>Type sc</code>	Copies frame 2 to swap screen.

Display frame 5.

<code>Type sp</code>	Pastes copy of frame 2 on frame 5.
----------------------	------------------------------------

Copy frame 3 to swap screen and paste it on frame 6.

Play flic to check it and save again under the same name, FISHINTI.FLI.



You have the completed IN09TEN1.FLI flic on the IN DISK.



Reload TENNISTI.FLI, repeat above sequence to copy frames, then save again as TENNISTI.FLI.

---



## Using a Macro to Color the Titles

Now, you'll color the seven frames of the "FISHINTI.FLI" flic you saved in the previous exercise, making two flics. Each will be half of the complete cycle for the illusion. In the first flic, the images become fainter on each succeeding frame; in the second, the images become brighter again.

To color the frames so that they become progressively fainter, you'll clip a cel of the image on one frame, paste it back in place with glass ink in the background color, move to the next frame, and do the same, each time reducing the ink strength. Leaving frame 1 at the equivalent of 100 percent ink strength (that is, its white opaque color), you'll reduce the ink strength to 89 percent on frame two and by 9 percent on each succeeding frame.

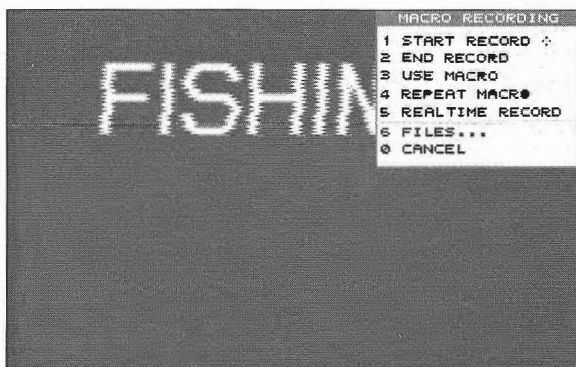
To create the other half of the illusion (in which the images become brighter again), you'll repeat the coloring in reverse. Starting from a low ink strength percentage, you'll increase each frame by nine percent until the last frame is at nearly 100 percent again. In Chapter 13, you'll join the two flics into one continuous movement of 14 frames in which the color goes from full strength to low and back up again.

You could do each frame by hand. However, it's less tedious to create a *macro*, and have Animator repeat the steps automatically for you. To create a macro, open the EXTRA menu and select RECORD. Then click START RECORD on the MACRO RECORDING submenu and perform the process that is to be repeated. When finished, click END RECORD on the MACRO RECORDING submenu and the macro is ready to be used. To run the macro you can select USE MACRO to go through the steps once only or REPEAT MACRO, which lets you specify the number of times to go through the macro. When you create a macro you might use again, you can save it as a REC file.

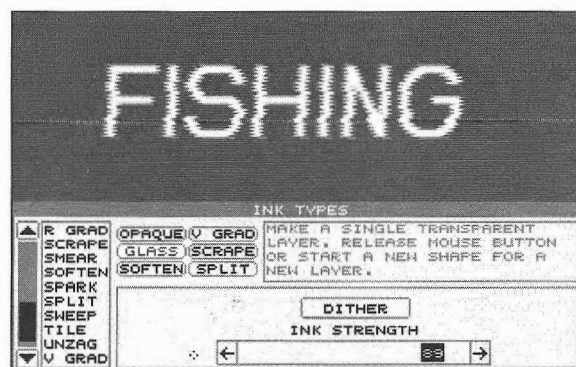
There is another way to record macros in Animator. If you want to see your cursor movements on screen when the macro plays back, you can select REALTIME RECORD instead of START RECORD. An example of a macro recorded this way is the sample macro file WELCOME.REC on the Animator release disk. Realtime macros record the time it takes you to perform them, which is good for demonstrations; but for doing work, normal macros run faster.

### Coloring the Frames With Decreasing Ink Strength

In the following exercise, you'll record a macro of the steps to apply glass ink to all of the frames that decrease in ink strength. You'll start with frame 2, having selected glass ink and set the ink strength to 89 percent. In order to ensure that repeated plays of the macro decrease the ink strength by 9 percent, you'll set the slider for the glass ink option by clicking nine times on the left arrow, rather than by moving the slider bar.



MACRO RECORD Submenu



Setting Ink Strength to 89 Percent

### Decreasing Ink Strength With a Macro

Continue from previous exercise, or load FISHINTL.FLI and set key color to blue background.

**Click key color** Selects blue key color as current color.

Display frame 2 of FISHINTL.FLI.

**Right click GLASS** Set ink strength to 89 percent using slider.  
Return to home panel.

**Open EXTRA Select RECORD** Displays MACRO RECORDING submenu.  
**Select START RECORD** Every click and keystroke will be recorded in macro until stopped.

**Press <tab>** Clips cel of image on frame 2 to cel buffer.  
**Type x** Clears screen.

Type `` Right click screen` Pastes cel in same place using glass ink at 89 percent strength.

Display frame 3 of FISHINTI.FLI.

Right click **GLASS** Displays ink types panel, ink strength slider for glass ink.

Click **left arrow** nine times Decreases ink strength by 9 percent.

Right click to return to home panel.

Type **er** Displays MACRO RECORDING submenu on EXTRA menu.

Select **END RECORD** Turns off macro recording function.

Type **er**

Select **REPEAT MACRO** Click **OK** Enter 5 as number of times to repeat macro and exit.  
The macro now plays through five times, decreasing ink strength 9 percent each time and coloring the next frame.

Type **er**

Click **FILES** Save macro as FISHIN01.REC.

Save the new flic as FISHIN01.FLI.

---

Unless you have the IN DISK, you'll use this macro again when you color the frames of the "TENNIS" title.

**NOTE** *Macros record only keys pressed, cursor movements, and mouse clicks. Before you begin recording, make sure that panels are in their default locations, or you'll get strange results on playback when the panels have been relocated. Also make sure before making or using a macro that the same tools and inks are on the home panel. For example, if you replaced glass ink with h grad ink and ran the macro you just recorded, the letters would be colored with horizontal gradients, not with glass ink. And make sure that the home panel is displayed — if the home panel is displayed when a macro is recorded but not when it is played back, the inks and tools will not be correctly selected. It's advisable to enter everything you possibly can from the keyboard while recording a macro to minimize such problems.*

### **Coloring the Frames With Increasing Ink Strength**

The final step is to color the frames in a second flic, one which consists of the same images, but with the ink strength increasing from frame 1 to frame 7. When you join this flic with FISHIN01.FLI in Chapter 13,

the frames in which the glass ink increases will become frames 8 through 14 of the combined sequence. The following table lists the progression of ink strength percentages for all the frames after they're joined into one flic.

Frame #	Ink Strength %	Frame #	Ink Strength %
1	100	8 (8 is frame	35
2	89	9 1 of second	44
3	80	10 flic)	53
4	71	11	62
5	62	12	71
6	53	13	80
7	44	14	89

*Ink Strength Percentages in Completed Cycle*

Because the last step in the macro you recorded in the previous exercise decreased the ink strength setting, the ink strength is presently set just right at 35 percent for the first frame of the second flic. You can check this before recording the second macro, which will be almost identical to the first. The difference is that you'll click the *right* arrow on the ink strength slider bar nine times to increase it, rather than decrease it. And this time you'll start on frame 1, so you'll play back the macro six times.

---

### Increasing Ink Strength With a Macro

**Load FISHINTI.FLI** Restores original seven frames, before they were colored.

Make sure the key color is the blue background and is selected as the current color.

Make sure that glass ink is selected with ink strength at 35 percent.

**Type *or*** Displays MACRO RECORDING submenu on EXTRA menu again.  
**Click START RECORD**

**Press <tab>** Clips cel of image on frame 1 to cel buffer.

**Type *x*** Clears screen.

**Type ` Right click *screen*** Pastes cel in same place in glass ink at 35 percent strength.

Display frame 2 of FISHINTI.FLI.

<b>Right click GLASS</b>	Displays ink types panel, ink strength slider for glass ink.
<b>Click right arrow nine times</b>	Increases ink strength by 9 percent.

<b>Type</b> <b>or2</b>	Displays MACRO RECORDING submenu on EXTRA menu and selects END RECORD, turning off macro recording
------------------------	----------------------------------------------------------------------------------------------------

Type or  
Click **REPEAT MACRO**      Enter 6 as number of times to repeat macro.

Type or  
Click **FILES** Save macro as FISHIN02.REC.

As with the first macro, you can use the macro FISHIN02.REC again to color the second set of frames for the “TENNIS” title.

### Applying Glass Ink to the TENNIS Title.



**Skip this exercise, you have the completed TENNIS flics as IN09TEN1.FLI and IN09TEN2.FLI.**



Load TENNISTI.FLI and FISHIN01.REC.

**Make sure the key color is the blue background and is selected as the current color.**

**Right click GLASS**      Set ink strength to 89 percent.

Type **or4** Enter 6 as number of times to repeat macro, coloring each frame.



Skip the rest, you have the flic as IN09TEN2.FLI.



Load TENNISTI.FLI again and FISHIN02.REC.

Type **or4**

Enter 7 as number of times to repeat macro, coloring all frames.

Play flic and save it as TENNIS02.FLI.

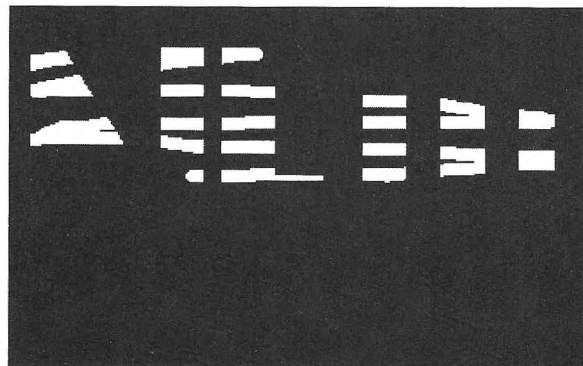
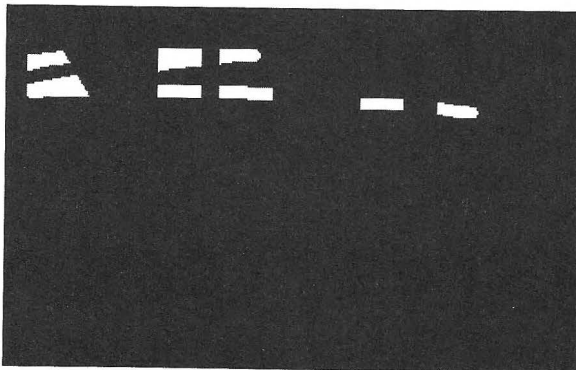
---

You now have four completed title flics.

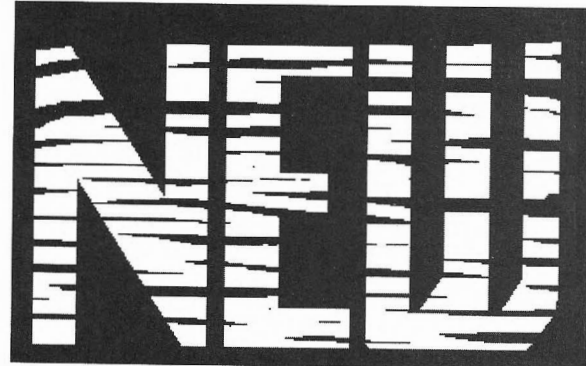
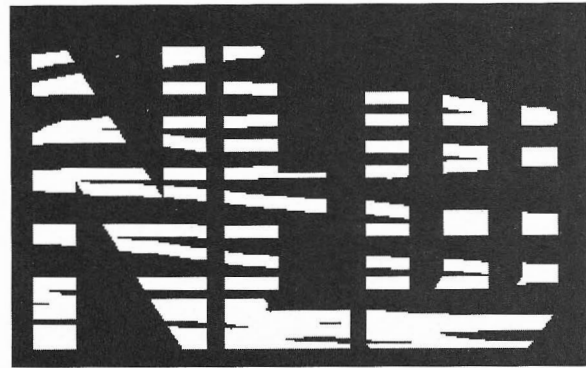
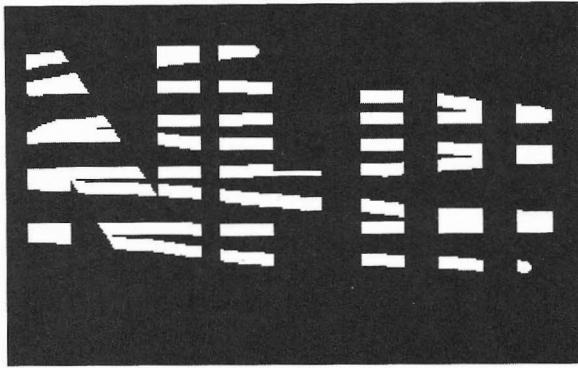
## Other Examples

The illustration at the beginning of this chapter is one of the final frames in an animation by Robert Quinn, intended as an ID for the television phenomenon, MTV. Eight frames from the MTV animation are included as examples in Chapter 14. Quinn's work is also shown at the beginning of Chapter 6; that illustration is one of a series of experiments with Animator's titling and image processing capabilities on text. This section has more frames from this animation and from one of the other experiments, both of which were done as animatics.

The word "NEW" becomes an abstract, hypnotic image in the next two sets of examples. In the first, the letters are masked, and the mask is then inverted. By using the mask, paint is applied to the letters only in a random effect that resembles stripes on a zebra.

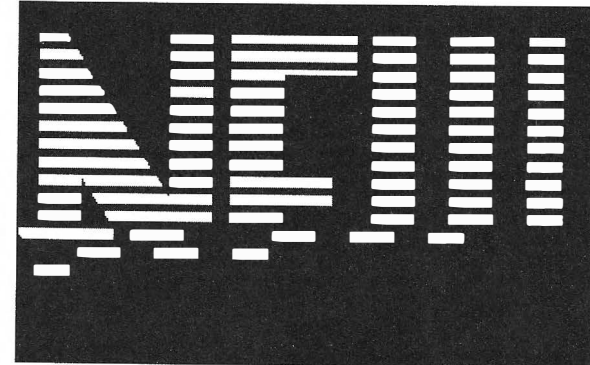
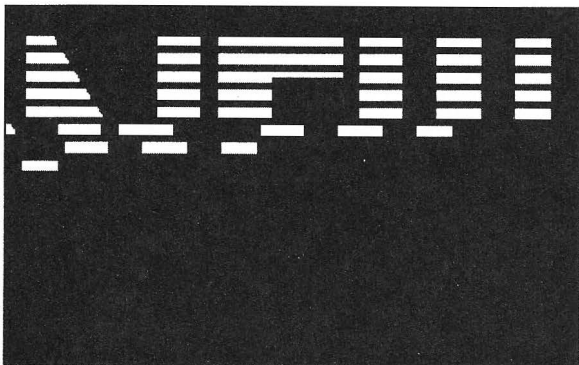
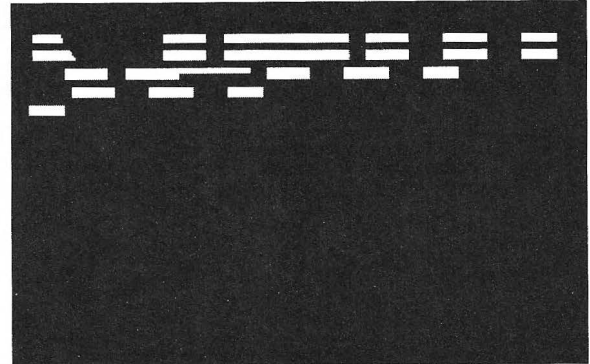
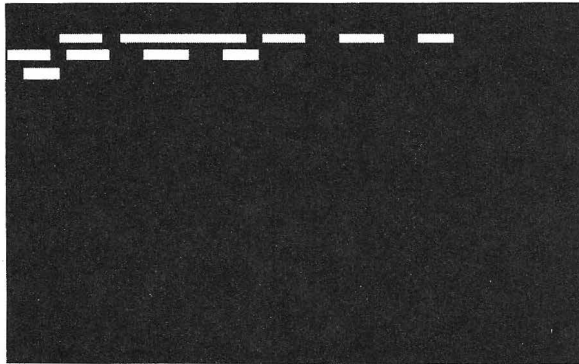


*Zebra-Striped NEW Titles*



*Zebra-Striped NEW Titles*

The selection of frames from another of Quinn's experiments with the word "NEW" is a wipe, in which the pattern spelling out the letters gradually emerges. The horizontal lines slide on screen and into position from the left, starting with only the upper part of the letters.



*Horizontal NEW Titles*

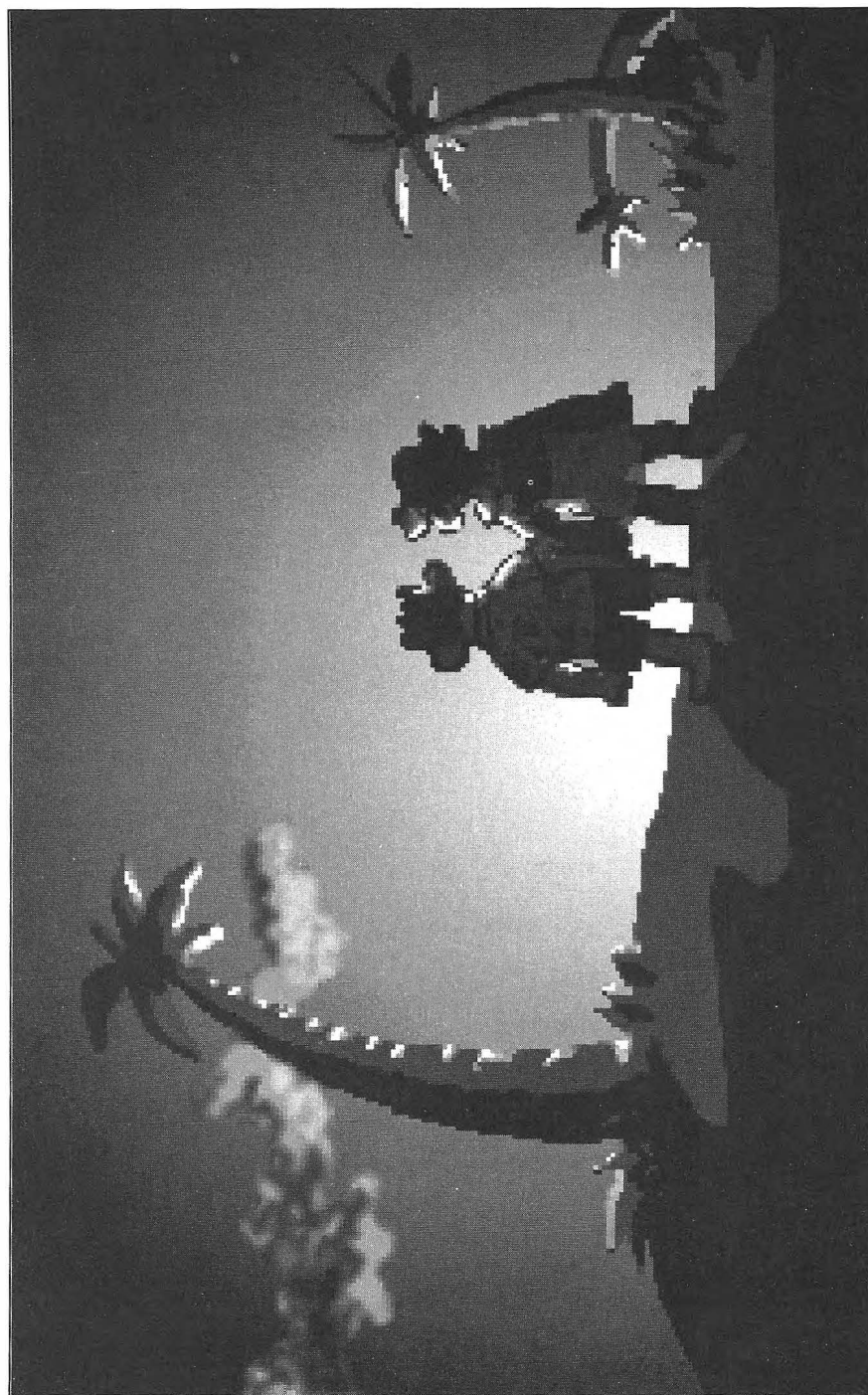


## Next Steps

As you've seen, altering images by applying inks in stages can create special effects in Animator. The order in which inks are combined can bring about very different results. Splitting the letters first and then softening them results in a completely different effect.

**MORE** *At your leisure, try first splitting the titles and then softening them.*

You've learned how to make two titles in this chapter which will be joined in Chapter 13 and composited with a background of water. One of the titles will ultimately identify a deep-sea fishing sequence from Chapter 11, in which a fish turns into a skeleton of itself. The other title appears at the beginning of a sequence you create in Chapter 12, in which a tennis ball wipes on and recedes into the distance.



*Glowing Expectations*

# Colors on the Move

Color cycling is a rich source of illusions that costs little in time, labor, or disk space. The artful play of colors fools the eye into seeing complexity in essentially simple animations, giving the impression of movement to static objects. The hoopla that precedes a made-for-TV movie often relies on simulating swirling light beams of rapidly cycling color.

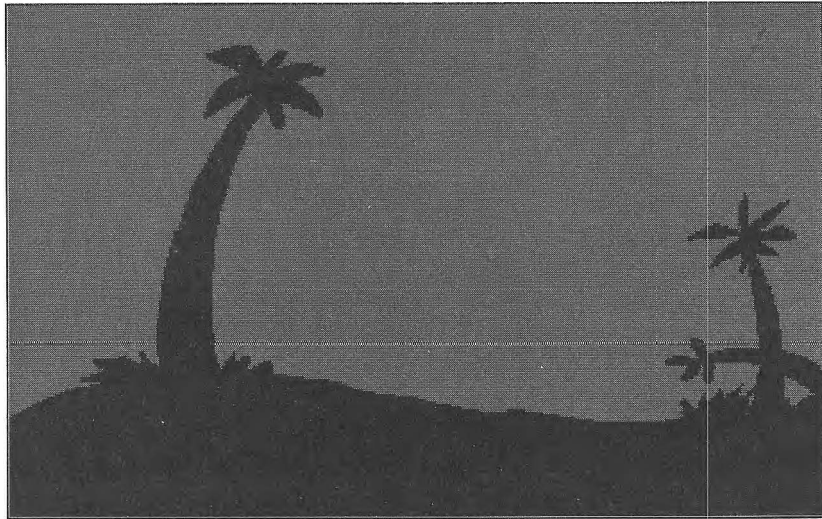
Among the illusions suited to color cycling are such grandiose effects as sunsets and rainstorms. At a more sedate level, color cycling is the basis of such industrial or mechanical demonstrations as liquid flowing through pipes. Like other types of animation cycles, the frames that make up one complete rotation through the colors can be repeated as many times as a project requires.

You tried out color cycling in Chapter 4 when you cycled a radial gradient on balloons to create the illusion of volume and highlights. Now you'll take up a more sophisticated application, using color cycling to create the illusion that the sun is slipping below the horizon, obliquely burnishing the palm trees on the beach at Club Baltic. Starting from a silhouette of the scene, you'll make a gradient for the cluster of colors to be cycled, apply the colors to the trees and cycle them. The back view of the couple you prepared in Chapter 8 will be shrunk, tinted, and turned into a cel you can paste onto the scene, both in color and in silhouette. The full effect of the illusion won't be completed until Chapter 13, where you'll composite a still flic of the silhouette onto the color cycling animation with a *cross-fade* that will darken the scene until it appears to be on the edge of nightfall.

## Preparing and Masking the Silhouette

In the following exercise you'll prepare a background scene of a beach and palm trees silhouetted against the sky. First you'll select a new

key color and background color. Then you'll draw the outline of the scene and fill it with an inky dark, nearly black, purple.



*The Scene in Silhouette*

The scene you draw can be more or less elaborate than the one illustrated. In order to have enough space to draw the lines for the cycling colors, draw the palm trees with thick trunks and broad, thick leaves.

**TIP** *Sometimes sketching with the draw tool leaves tiny gaps through which ink seeps when you use the fill tool. If this happens, undo the fill and use close ink to eliminate the gaps before filling the outline again.*

If you have access to a scanning device, you may want to sketch the scene on paper and scan it in. For those who have the IN DISK, you can skip to the next exercise and load the picture file IN10SILH.GIF instead.

---

### Drawing the Scene

Type **fry**

Type **@**

Displays palette panel.

Right click **key color**

Prepares key color to be changed.

<i>Click color matrix slot</i>	<i>Select</i> deep blue, slot 16 in row 4 (source 111), as key color.
<i>Right click mini-palette</i>	<i>Select</i> light blue color to be changed.
<i>Click color matrix slot</i>	<i>Select</i> dark purple color in row 6, slot 21 (source 180) to replace light blue in mini-palette.

Return to home panel.

<i>Click key color</i>	Selects key color as current color.
<i>Type pa</i>	Fills background with blue key color.

<i>Click mini-palette</i>	<i>Select</i> dark purple as current color.
<i>Use DRAW</i>	<i>Sketch</i> outline of beach and palm trees, as illustrated.
<i>Click FILL Click screen</i>	<i>Fill</i> below outline with dark purple.

If the fill leaked through any gaps, click UNDO, select close ink from ink types panel and apply; then fill again with opaque ink.

Save picture as SILHOUET.GIF.

Now you'll create a mask of the sky to make it easier to draw the lines where the cycling colors go on the trees and leaves. Before doing so, you'll change the current color to dark red so that the masked area is visible when it's displayed. You'll use CLIP on the MASK submenu to include everything on screen that is not in the key color, in this case the beach and trees.

However, what you actually want to mask is the sky, which is in the key color. To do this, you'll use INVERT, which makes a new mask of everything but the existing mask. Then, you'll select VIEW. If only the sky is displayed in the current color, that will confirm that the mask is correct before you save it.

---

## Masking the Sky



Load IN10SILH.GIF and set key color to blue background.

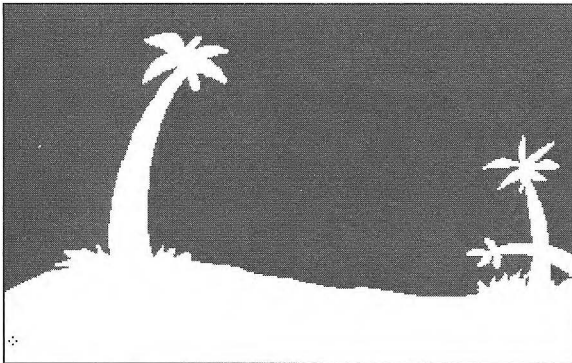


Continue from the previous exercise, or load SILHOUET.GIF and set key color to blue background.

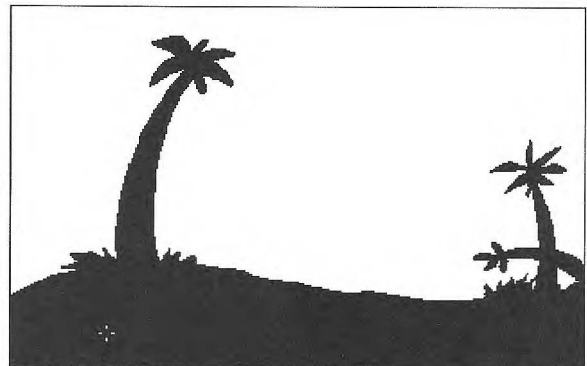
Click <b>mini-palette</b>	Select dark red as current color, so masked areas will show up.
Right click <b>[M]</b>	Displays MASK submenu.
Select <b>CLIP</b>	Creates mask of image and displays it.
Right click <b>screen</b>	Displays MASK submenu again.
Select <b>INVERT</b>	Creates mask of sky.
Right click <b>screen</b>	
Select <b>VIEW</b>	Displays mask of sky.
Right click <b>screen</b>	
Click <b>FILES</b>	Save mask as SILHOUETMSK and return to home panel.

---

Selecting INVERT did not turn on the mask. As you can see when the home panel is displayed again, the [M] button is not highlighted, indicating that the mask is not in effect. When you do turn on the mask later, it will be inverted.



*Clipping the Mask*



*Inverting the Mask*

## Setting Up the Palette for Color Cycling

As you probably recall from Chapter 4, each color on screen that is in the current cluster shifts frame by frame through all the cluster colors during color cycling. With 262,144 colors to choose from, you have a good deal of leeway in gathering together a cluster that contains the colors you want. If your project calls for it and you have the patience, you can hand pick and adjust each color until you have the absolutely optimal assortment the program offers. You can also rearrange the

cluster colors according to their luminance values or other criteria by selecting from the **ARRANGE** menu on the palette menu bar.

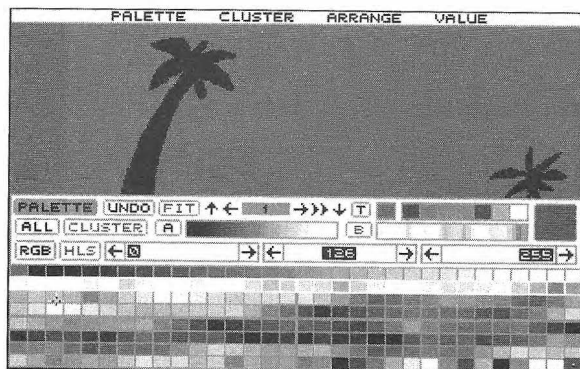
For the sunset, you'll make a gradient of yellow gold to reddish orange colors in a cluster of 32 colors. First you'll define the entire second row of the color matrix as the new location for the colors in the [B] cluster box. Then you'll make the gradient by selecting **RAMP** on the **VALUES** menu and specifying first a yellow gold and then a reddish orange color as the start and stop colors.

### Selecting the Colors to be Cycled

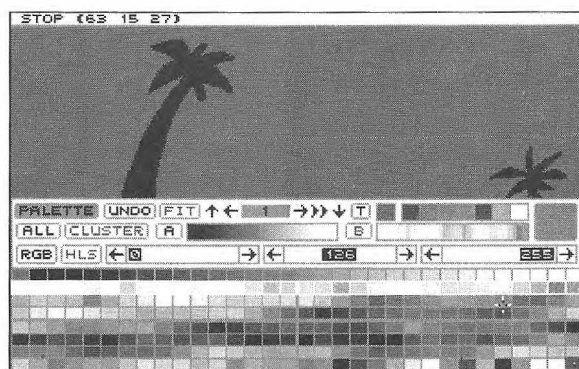
Continue from the previous exercise or load **SILHOUET.GIF** and **SILHOUET.MSK**.

- |                                               |                                                                                                                              |
|-----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| <i>Type</i> <b>@</b>                          | Displays palette panel.                                                                                                      |
| <i>Open</i> <b>CLUSTER Select GET CLUSTER</b> | Select first and last slots in row 2 as start and end slots of new cluster.                                                  |
| <i>Open</i> <b>VALUES Select RAMP</b>         | Select yellow in third slot of row 4 as start color and red in fifth slot of row 3 as end color of gradient for new cluster. |

The second row of the color matrix and cluster [B] should now display a gradient from yellow to red.



*New Cluster Defined in Row 2*



*Selecting Ramp Colors*

***TIP*** *For interesting yet subtle color cycling effects, make a cluster that combines two gradients. First define the area for the cluster and use RAMP to make a gradient between two colors. Next define an adjacent area for a second cluster and make another gradient, using the end color of the first ramp as the start color. Then redefine the cluster as all the slots containing both gradients.*

## **Applying the Colors on Screen**

Now you can apply the colors that are to be cycled. Imagine that the sun is setting out over the ocean, casting its last rays onto the palm trees and the vegetation on the beach, its position directly back from the middle of the screen. (Since this is an illusion, we won't be overly fastidious about the direction the sun sets in relation to Baltic beaches, nor, for that matter, whether palm trees happen to thrive there.)

You'll then refine the picture by adding shadows on the sand and by adding horizontal bands across the ribbons of color to suggest the striations on palm tree trunks.

### ***Applying the Cluster Colors***

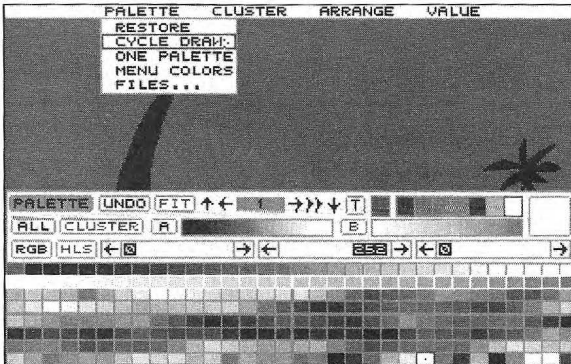
To apply the cluster colors sequentially, you'll select CYCLE DRAW on the PALETTE menu and use the draw tool with a size five or larger brush. When you draw a line with CYCLE DRAW on, the color of the line cycles from one to the next of the cluster colors, like a multi-colored taffeta ribbon. CYCLE DRAW remains on until you turn it off or select another color as the current color.

Before starting to draw, you'll turn on the mask. This will let you paint a continuous swath of colors down the side of the large palm tree and put in other lines and dabs of color without spilling outside the masked outline.

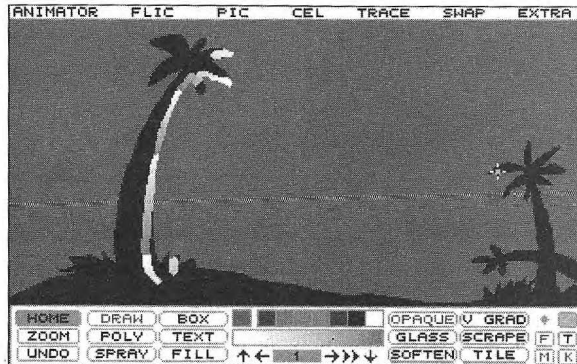
The lines of color should go down along the right-hand side of the tree on the left and down the left-hand side of the trees on the right, so they appear to glow from the sun in the center. Draw all vertical lines from top to bottom, and all horizontal or diagonal lines from the center outward. Otherwise, the cycling will resemble a bad neon sign.



For best results, draw down the side of the large palm tree all in one stroke, as in the illustration. Stopping and starting the line again interrupts the cycle. Varying your speed while drawing produces different cycling effects. Drawing slowly bunches up colors; drawing faster spreads them out. If you don't like the results, draw over them or undo and try again.



Selecting CYCLE DRAW on PALETTE Menu



Applying Colors With CYCLE DRAW

The palette panel and its menu bar should still be displayed and cluster B should be selected.

## Applying Colors to the Silhouette

Continue from previous exercise.

Open **PALETTE** Select **CYCLE DRAW** Turns on CYCLE DRAW, marking it with an asterisk.

Return to home panel.

Right click **BRUSH**

Click **[M]**

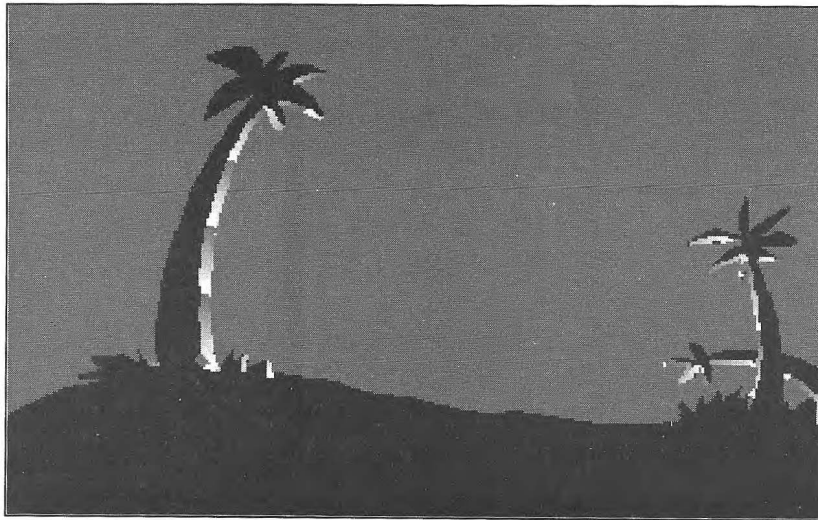
Click **DRAW**

Set brush slider to 5 (or larger) and return to home panel.

Turns on inverted mask of sky.

Draw multi-colored lines on trees and low bushes, as illustrated.

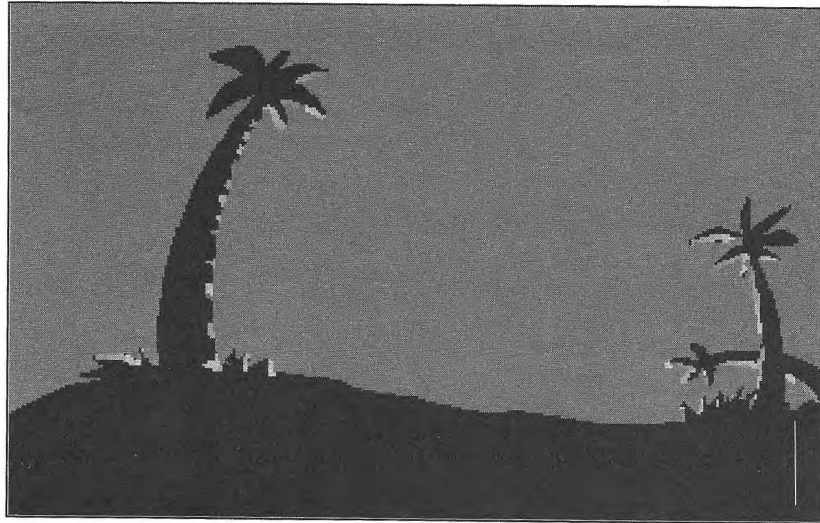
Save picture as **SUNSET.GIF** and palette as **SUNSET.COL**.



*Cluster Colors Applied With CYCLE DRAW*

### ***Refining the Illusion***

In the following exercise, you'll change the current color to the dark purple, which will turn off CYCLE DRAW. You'll draw lines across the trunks to suggest the irregular rings that jut out from them in profile. Draw these lines through the colors in an irregular, sketchy fashion. This will give a subtle effect to the cycling, as if the sun is hitting just the tips of the rings.



*Purple Horizontal Lines Added*

Then, you'll draw patches of a light purple on the trees and sand. By marking off areas in this color and filling them in, what remains in the dark purple will appear to be in shadow.

---

### Adding Purple Lines

Continue from previous exercise.

*Right click* **BRUSH**

*Move cursor* Press <f1>

*Use* **DRAW**

*Type* @

*Right click* **mini-palette**

*Click* **color matrix slot**

Return to home panel.

*Click* **mini-palette**

*Use* **DRAW**

*Use* **FILL**

*Click* [**M**]

Save completed picture as SUNSET.GIF again.

*Set* brush to size 2 or 3.

*Pick up* purple color from screen as current color, turning off CYCLE DRAW.

*Draw* lines across trunks of palm trees, as illustrated.

*Displays* palette panel.

*Select* orange in mini-palette to be replaced.

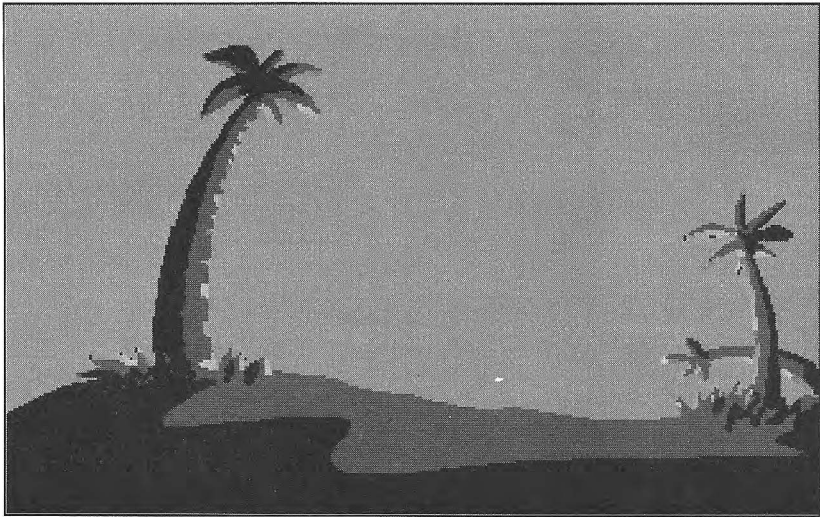
*Select* light purple in slot 16 of row 6 to replace orange in mini-palette.

*Select* light purple as current color.

*Outline* areas for patches outside of shadows, as illustrated.

*Fill in* unshadowed areas with light purple color, as illustrated.

*Turns off* mask.

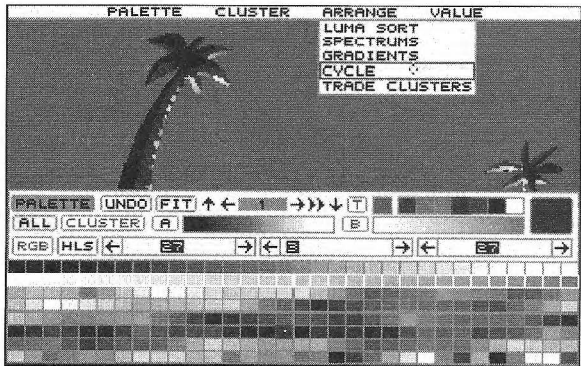


*Shadows Painted on Scene*

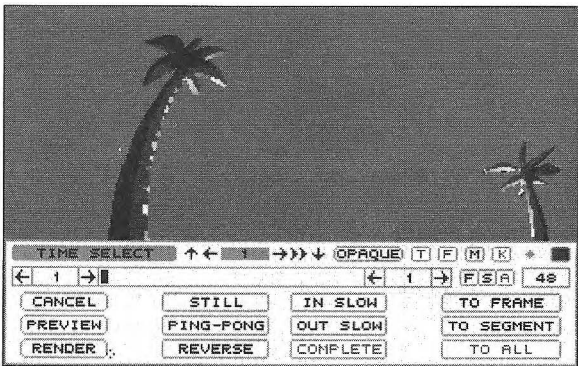
### Cycling the Colors

Now you can make the flic and see how the cycling colors look. As you may recall from Chapter 4, you need to turn on the [T] button so that all the frames are included in the cycling. You also need to turn off FIT, so that Animator doesn't defeat the cycling by trying to keep the original colors. In this instance, the cluster to be cycled, cluster [B], is already selected and CLUSTER is on by default.

2H IN10CYCL



*Selecting CYCLE*



*Time Select Panel Ready to Cycle Colors*    CYCL/TIMS

The cluster you set up occupies an entire row of the color matrix; that is, 32 colors. Thus, the flic must be at least 32 frames long to cycle all the colors once. But the illusion that sunset is turning into nightfall needs more frames. So when you make the frames for the flic, you'll allow 32 frames for one complete cycle plus an additional 16 frames for the sunset to fade away.

---

## Cycling the Colors

Continue from the previous exercise.

Type <b>@</b>	Displays palette panel.
Click <b>[T]</b>	Turns on time select.
Click <b>FIT</b>	Turns off fit.
Open <b>ARRANGE</b> Select <b>CYCLE</b>	Displays time select panel.
Right click <b>frames control icon</b>	Set 48 frames for flic (1 1/2 cycles through the cluster).
Right click <b>screen</b>	Returns to time select panel.
Click <b>RENDER</b>	Shifts cluster colors by one slot on each frame.

Return to home panel, play flic, and save it as SUNSETFLI.

---

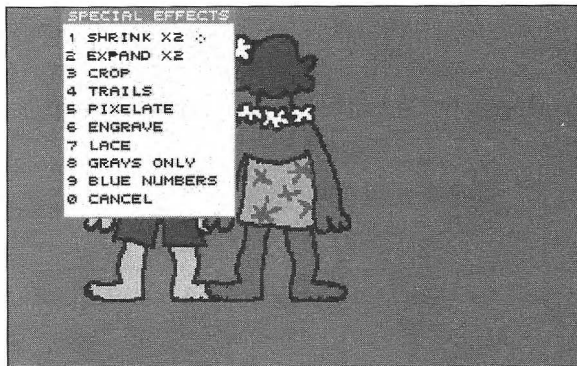
As the flic plays, the colors seem to flow down the trees.

## Placing the Couple on the Scene

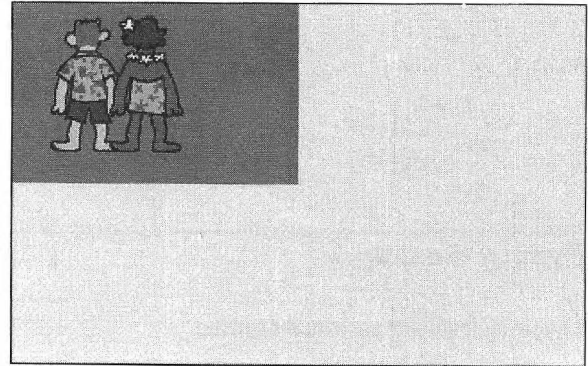
The final exercises in this chapter add the couple to the scene. You'll shrink the back view of the couple that you made in Chapter 8, BACKVIEW.GIF, and tint the figures with light purple, so they'll blend into the color cycling animation. Then you'll clip the image as a cel and paste it in the same position on all the frames of the color cycling animation.

### *Placing the Couple in the Color Cycling Flic*

The SUNSET.FLI flic you made in the previous exercise should still be current. You'll copy frame 1 to the swap screen and turn the [T] button off so you can clear just one screen. After the cel has been shrunk and tinted, you'll turn the [T] button back on to paste the cel to all the frames at once.



*Shrinking the Couple*



*Couple After Shrinking*

---

## Placing the Couple on the Scene

Continue from previous exercise, or load SUNSET.FLI.

Make sure key color is blue sky color, slot 16 of row 4 in the color matrix.  
Display frame 1 of SUNSET.FLI.

Type **sc**                                      Copy frame 1 to swap screen.

Turn [T] button off, so subsequent action affects only the frame displayed.

Type **x**                                      Clears screen to deep blue key color.

Load BACKVIEW.GIF.

Open **FLIC** Select **EFFECTS**      Displays SPECIAL EFFECTS submenu.

Click **SHRINK X2**                      Reduces image to one-fourth its size.

Display palette panel.

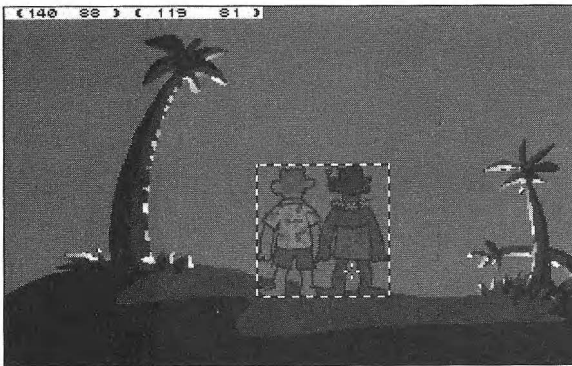
Click **ALL**                                      Subsequent effects applied to all color matrix slots, instead of cluster slots only.

Open **VALUE** Select **TINT**              Select light purple in slot 16 of row 6 as tinting source.

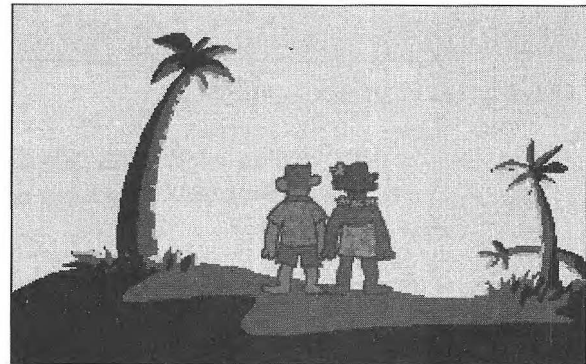
Accept default of 50 percent tint and tint the cel.  
Return to home panel.

<b>Click key color</b>	Selects deep blue key color as current color.
<b>Type ps Click screen</b>	<i>Click</i> in gray background surrounding couple to change it with separate to blue key color.
<b>Press &lt;tab&gt;</b>	Clips cel.
<b>Type sp</b>	Pastes frame 1 from swap screen.
<b>Type M Click screen</b>	<i>Move</i> and click to position cel of couple on beach as illustrated.
<b>Click [T]</b>	Turns time select on.
<b>Type ` Right click screen</b>	<i>Render</i> to paste cel of couple in moved position on all frames of SUNSETFLI.

Save flic again as SUNSETFLI and save cel as BACKVIEW.CEL.



*Moving the Cel*



*After Pasting the Cel*

You've completed the preparation for the color cycling animation. You'll return to it in Chapter 13, where you'll composite the last 16 frames of the color cycling with 16 frames of the couple in silhouette.

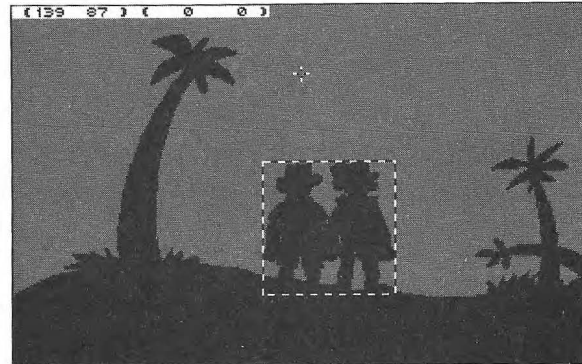
### ***Placing the Couple in the Silhouette Flic***

The silhouette you drew at the beginning of this chapter is the basis for a flic you'll make now. This flic will become the end of the color cycling sequence in Chapter 13, when the sun sets and the colors fade out, leaving only the dark purple color of the silhouette. The cross-fade compositing option will produce this effect by fading out the color cycling frames and simultaneously fading in the silhouette frames.

To prepare this flic, you'll make 16 frames of the static silhouette and paste the cel of the couple onto them. To match the cel to the silhouette, you'll change the current color to dark purple and select 1 COLOR on the CEL menu. Then, when you paste the cel, it will be in the same color as the rest of the silhouette.



*Selecting 1 COLOR on the CEL Menu*



*Pasting the Cel on the Silhouette*

The cel, BACKVIEW.CEL, should still be in the cel buffer, in the correct position for pasting on the silhouette.

---

## Placing the Couple on the Silhouette

Continue from previous exercise and type FNY to clear out SUNSET.FLI, or load BACKVIEW.CEL.

Make sure the [T] button is turned on.

Load SILHOUET.GIF, create 16 duplicate frames on the frames panel, and return to home panel. Make sure blue sky is selected as key color and dark purple as current color.

Open **CEL Select 1 COLOR**      Converts cel to current color.  
Type ` Right click **screen**      Render to paste cel in place on silhouette on all 16 frames.

Save flic as SILHOUET.FLI.

---

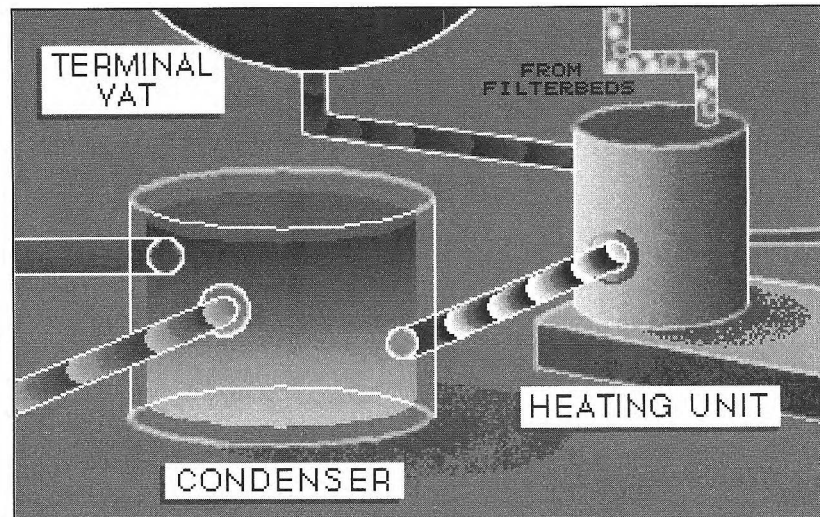




*Silhouette With Couple*

## Other Examples

Color cycling can be used to illustrate mechanical and industrial processes. The technical illustration which follows shows a desalinization system. After masking the edges of the pipes and the surrounding area, the water was drawn with CYCLE DRAW turned on, using the largest brush, size 11. Then each cluster was cycled over the range of frames and rendered for the animation.



*Water Flowing Through Pipes in a Desalinization Process*

Colors were selected and arranged in three different clusters to differentiate the qualities of the water in each pipe. The water in the upper pipe is made up of a cluster of muted colors, to suggest a cool temperature. The colors for the water pipe in the middle of the screen, which is the dramatic focal point of the layout, have been selected for higher contrast to give the impression the water has been heated at this point and is warmer.

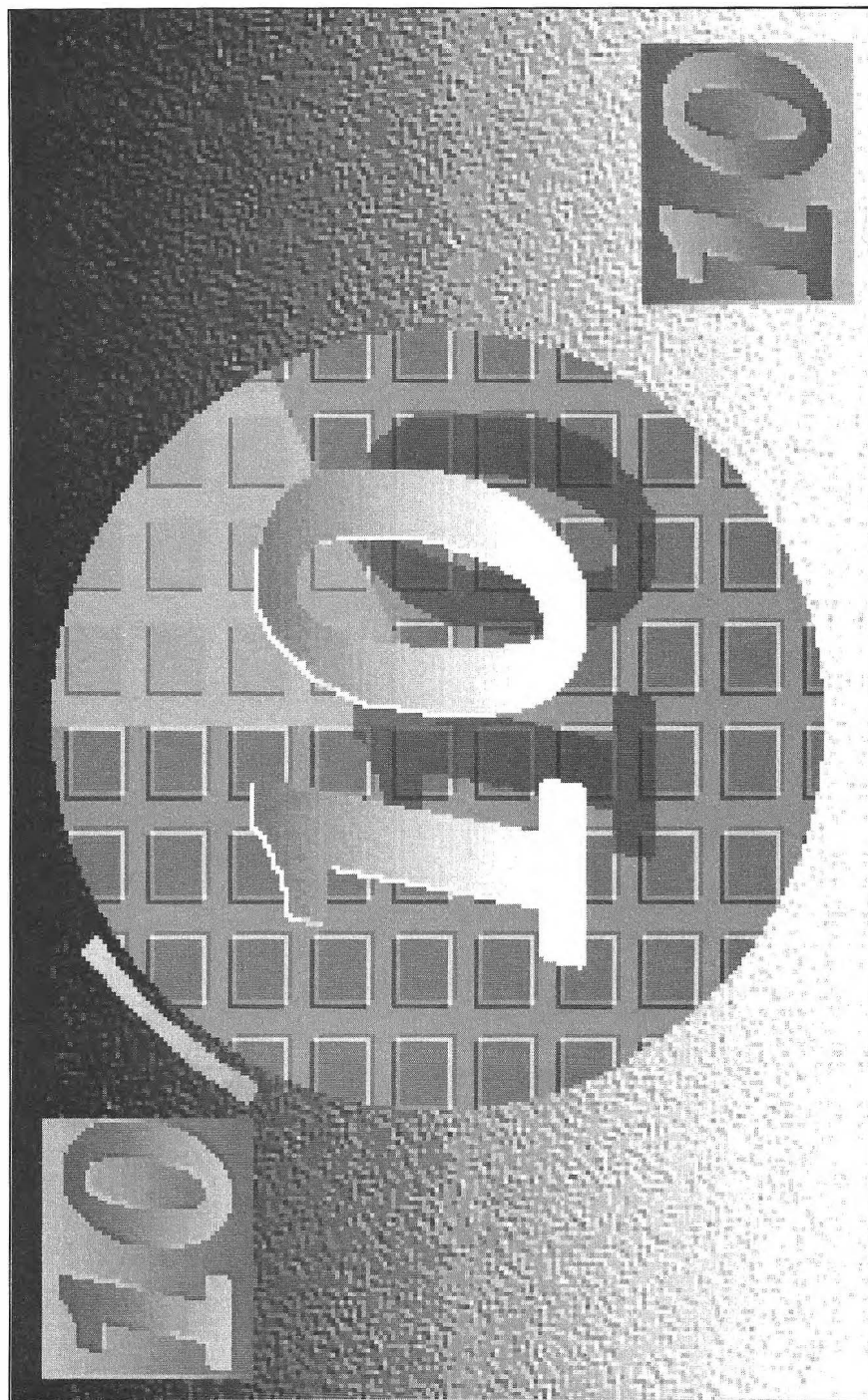
Although all the clusters cycle at the same speed when the animation runs, the water in each pipe appears to flow at a different rate. The clusters cycling through the upper and middle pipes occupy the same number of slots in the color matrix. However, because of the higher contrast between colors in the middle pipe, the water appears to flow faster. The cluster for the pipe at the lower left of the screen consists of a larger group of similar colors; as a result, the water in this pipe appears to be flowing more slowly than the water in the other two pipes.

**TIP** *If you've used color cycling on other systems, you may be surprised to find that in order for the circular rims of water drops to point in the direction the water is flowing, you must draw in the opposite direction.*

## Next Steps

In Chapter 13, the color cycling flic and the silhouette flic created in this chapter will be combined so that only the silhouette will remain, outlined against the sky. The resulting sunset sequence will then become part of a dream vision the lonely guy has that propels him to Club Baltic for fun and frolic.

In Chapter 11, you'll develop another sequence for the Club Baltic animation. In it, a process called polymorphic tweening will enable a fish to be turned into its own skeleton.



*Counting Down From 10*

# Metamorphoses

Metamorphosis, one thing turning into something else, is a recurring event in myths — humans turn into trees, stags, flowers, spiders. In the movie classic, Lon Chaney turns into a werewolf right before our eyes. Animation has been a perfect medium for conveying such transformations, with subtle changes drawn by hand, frame to frame. Depending on the tone of the animation, metamorphosis can be a startling special effect, surprising us into fear or laughter.

## Polymorphic Tweening

Polymorphic tweening is Animator's function for creating metamorphoses. It does not allow you to produce all the effects you could if you were making the changes by hand using classic animation techniques. Polymorphic tweening automates the metamorphosis of one polygonal shape into another. The program figures out and draws all the changes required to transform shape A, the *start polygon*, into shape B, the *end polygon*, over the number of frames you've allocated.

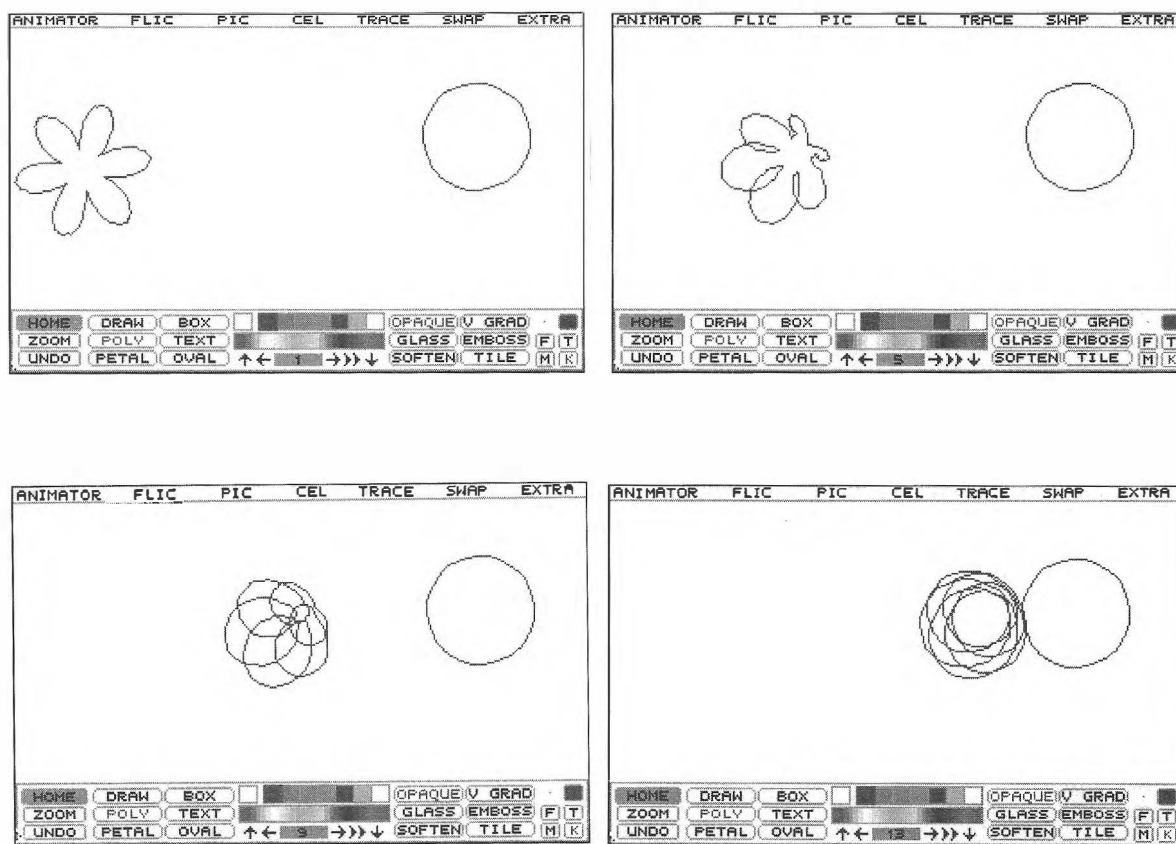
The degree and kind of change from frame to frame is under the computer's control and is determined by its internal logic. Central to the program's calculations is the number of points it attributes to the start and end polygons; it then moves all the points incrementally from their starting positions to form the final shape.

For instance, if you were animating the moment in *The Wizard of Oz* when the Wicked Witch turns into a puddle of water, you might want to dissolve her feet first, then her long dress, ending with her hat. Polymorphic tweening can't do that. All the points of a polygon change starting from the beginning of the sequence.

You were introduced to polymorphic tweening in Chapter 3, where you animated one column of a chart. That involved a simple adjustment of the upper portion of a rectangle so that the column

stretched to reflect the increase in March sales. This chapter demonstrates a more complex transformation. You'll change a fish into its own skeleton, using two different drawings as the basis for the start and end polygons. The fish sequence will be incorporated into the Club Baltic animation in Chapter 13.

Polymorphic tweening produces a distinctive style which may not be appropriate for all metamorphoses. The inbetweens are often awkward in shape and inelegant. When you tween objects that have many points, a peculiar side effect appears. As you can see in the illustration of a petal tweening into an oval, the petal turns into many ovals before forming the final oval shape. Yet, despite its limitations, polymorphic tweening is a powerful tool when you design metamorphoses that are suited to it.



*Petals and Ovals Tweening*

**TIP** *Breaking complex shapes into a series of open lines or curves and rendering each pair of lines or curves separately sometimes yields more predictable, less awkward inbetweens. Experiment with the poly and spline tools, turning off the closed and filled options.*

Even if the inbetweens are not the finished version of what is needed for professional animation, you can create them with polymorphic tweening and edit them, rather than draw them all by hand. In many circumstances, polymorphic tweening can be a shortcut or a quick way to test a metamorphosis.

## Polygons for Tweening

Polymorphic tweening works only with objects that the program recognizes as polygons. These are the geometric objects created with tools designated as *tweenable*. The tweenable tools are:

- Oval
- Petal
- Poly (polygons with variable straight segments)
- Rpoly (polygons with regular, equal sides, such as triangles and octagons)
- Shape (freeform objects)
- Spiral
- Spline (polygons with variable curved segments)
- Star

Animator treats objects drawn with any of the tweenable tools as a series of points connected by line segments that are either straight (poly, rpoly, star, shape) or curved (oval, spiral, spline, petal). The poly and spline tools can create open or closed figures, spirals are always open, and the rest always create closed figures.

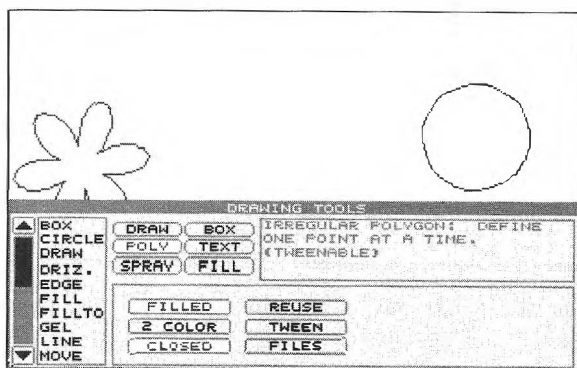
The start and end polygons must be drawn with one of these tools. You cannot tween an object drawn with the circle tool or with the box tool. Nor can you paste a cel or load a picture drawn yesterday. Pictures brought in from other programs or scanned in do not qualify as polygons, even if they are drawn as polygons in the original program.

Of course, you can draw almost any shape you'd like with the tweenable tools. The possibilities of freehand curved objects are vast with the spline tools, of freehand straight-sided objects with the poly tool. You can draw a circle with the oval tool and a square box with the rpoly tool.

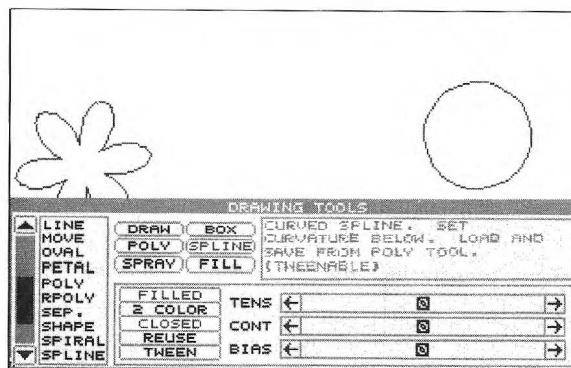
If you draw a tweenable shape and save it as a polygon file (PLY), you can later load it and tween it. You can scan in a digitized image you want to use as the starting drawing for a tweening, and trace it with a tweenable tool. And if the filled option is turned on, closed polygons will be tweened as filled objects.

### *The Polygon Buffer*

The points that define the most recent polygon you've drawn (or loaded from a polygon file) are stored temporarily in the *polygon buffer*. The contents of the polygon buffer become visible when you select the reuse option for the poly tool or spline tool, or when you select the tween option and then one of the options on the TWEENING OPTIONS submenu. An optics move also uses this buffer's contents when a polygon or spline is the selected element.



*Poly Tool Options*



*Spline Tool Options*

Shapes you create with the poly tool can be converted to splines and vice versa by using one tool to draw the shape (putting it into the buffer) and the other to reuse it or tween it (recalling it from the buffer). The spline tool's tension, continuity, and bias settings determine the curvature of spline segments — high settings can create some pretty wild shapes. Shapes created with the star and rpoly tools can also be converted to splines. But petals and ovals are



constructed of many short line segments, so the difference between straight and spline curved segments is not discernable.

**TIP** *You can, of course, use the tweenable tools to create shapes you don't intend to tween. When you select REUSE for either the poly tool or spline tool, you can adjust the points the same way you adjust the start and end positions before tweening. To obtain exactly the results you want in a metamorphosis, you can manually make such adjustments to a polygon over a sequence of frames.*

You may have three different polygons in the buffer at once: a start polygon and an end polygon (the first and last position of a polymorphic tweening), and a current polygon. Any new polygon you draw or load becomes the current one in the polygon buffer. This is the polygon that is recalled if you choose the reuse option for the poly tool or spline tool and if you perform an optics move with a polygon or spline.

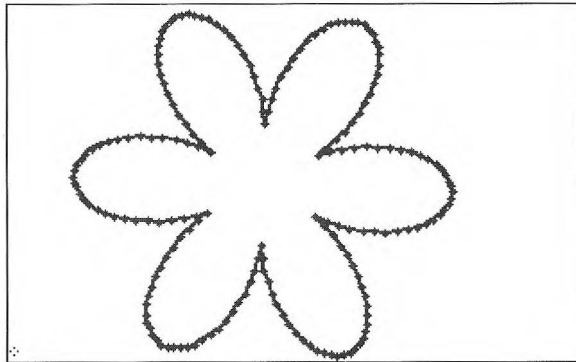
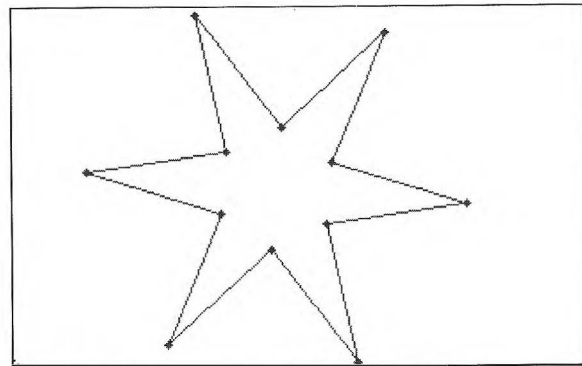
**TIP** *To minimize confusion about which polygon is which, save them in polygon files and load each when ready to use it. Saving polygon files also reduces the likelihood of inadvertently removing one you want from the buffer.*

### **Matching Points**

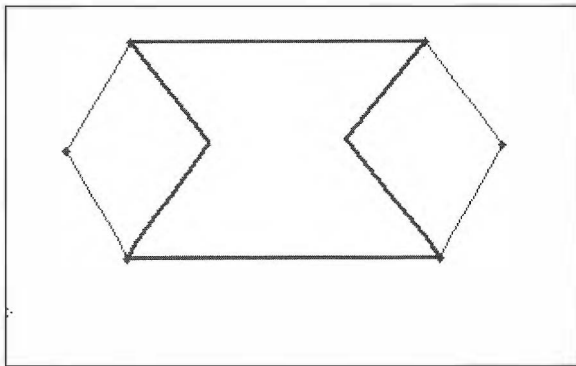
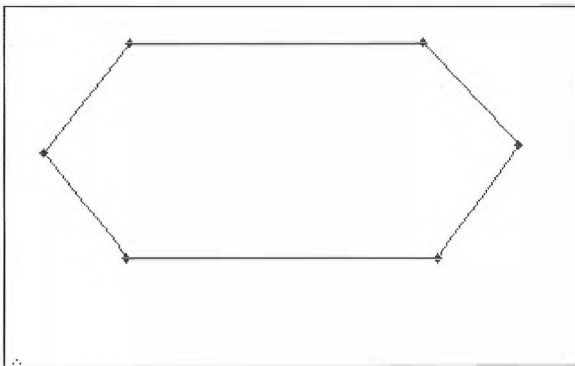
Perhaps you've been experimenting with polymorphic tweening already. If so, you may have discovered that some combinations of polygons don't tween properly. For tweening to work, the polygon used for the starting position must have the same number of points or more than the polygon used for the final position.

For example, you can tween a petal to a star, but you cannot tween a star to a petal. As the illustrations indicate, the petal has many more points than the star. If you try to tween a star into a petal, the star starts out and then gives up, turning into a dispirited, amorphous shape. Similarly, you can tween a petal to an oval, but not the reverse.

**TIP** *When you need to tween from a few points to many points, tween the figures backwards, and then save the flic in reverse by selecting BACKWARDS on the FLIC menu.*

*Points in a Petal**Points in a Star*

So long as you adjust the points of the start polygon to produce the end polygon, the number of points are identical. Thus, you'll never have the problem of trying to tween from too few to too many points. However, you'll want to use freeform shapes that don't have a predictable number of points. To do so, draw the starting shape with the poly tool, picking extra points to make sure it has more points than the final polygon.

*Adjusting Points of Start Polygon**End Polygon*

**TIP** *If you really want to change a star into a shape like a petal, convert the star to a spline after setting the tension, continuity, and bias settings for outward curves. The spline shape keeps the star's points.*

## Blending Drawings With Start and End Polygons

The tweenable tools are necessary for tweening, but they are not the most flexible tools for drawing complex, interesting images. Once the tweening is under way, the comparative crudity of the polygons is largely obscured by the motion. To smooth the transition from the preceding sequence into the tweening, insert several frames of a more detailed drawing of the start polygon so that the drawing blends into the beginning of the metamorphosis. Similarly, following the tweening with several frames of a more detailed drawing of the end polygon can make a bridge to the next sequence.

In the Club Baltic animation, the fish-to-skeleton metamorphosis occurs as the fish is swimming along. At the end, the skeleton swims away. The start polygon of the fish should seem to be an extension of the fish in the preceding sequence, and the end polygon should lead into the swimming skeleton in the following sequence. You'll create this illusion by blending a more detailed drawing of the fish with the start polygon and a more detailed drawing of the skeleton with the end polygon. You'll prepare the fish and skeleton drawings first, and then trace them to create the start and end polygons. When combined, they will all blend smoothly from one to another.

You can use this process to prepare a drawing you've scanned in, even a photograph, for tweening. Trace the essential shape with the draw tool so that you can create a start polygon by tracing over it with the poly tool. If the scanned image is more than one color, try selecting CLIP CHANGES on the CEL menu to remove only the new drawing. Then you can paste the new drawing to the swap screen with REPEAT CHANGES, also on the CEL menu, and save it as a picture file.

## Preparing Drawings for Tweening

For the first drawing, you'll enlarge an outline of the fish cel you worked with in Chapter 5, FISH.CEL is included in the release software. Then you'll streamline the fish's shape so that it will blend better with the start polygon you'll trace with the poly tool. Once the fish is ready, you'll draw the skeleton over it and trace the skeleton to create the end polygon for the tweening.

If you have the IN DISK, the drawing of the fish is IN11FISH.GIF and the drawing of the skeleton fish is IN11SKEL.GIF. You can skip ahead

to the exercises on preparing the polygons for tweening, but you might miss practicing some interesting techniques.

### ***Stretching the Fish Cel***

To prepare the fish for the metamorphosis, you'll load the cel, paste it on a light blue background, and change the cel's background to the same blue color. Then you can enlarge the fish with STRETCH on the CEL menu.

When you select CEL STRETCH, the cel appears surrounded by a marquee box. You can move the cel, flip the image, or extend it horizontally (along the X axis), vertically (along the Y axis), or both horizontally and vertically at the same time:

- Click inside the cel and move the cursor to relocate the cel, as you do with CEL MOVE or CEL PASTE.
- Click outside the left or right side of the cel and move the cursor away to increase the width of the cel. Bring the cursor across the cel to flip it horizontally.
- Click outside the top or bottom side of the cel and move the cursor away to increase the height of the cel. Bring the cursor across the cel to flip it vertically.
- Click outside one of the corners of the cel and move the cursor to increase both height and width at the same time.

Clicking sets the current position. You can repeat the process if you want to do another move, stretch, or flip. The status line indicates the amount of increase along the X and Y axes. Right clicking completes the procedure.

**TIP** *To return to 100 percent for both X and Y axes during a stretch, click inside the cel as if to move it, and immediately click again.*

The numbers on the status line jump somewhat erratically while you are stretching a cel — in the following exercise, an approximation will do just fine.

## Enlarging the Fish Cel



Do this and the next two exercises, or skip to the section, *Preparing Polygons*.



Do this and the next two exercises to prepare the two drawings.

### Type **fry**

Fill screen background with default light blue color and make it the new key color.

Load FISH.CEL from \AA directory or from directory you keep it in, and paste it in middle of screen.

Change background of cel, eye, and fish interior to blue key color.

Clip changed fish to cel buffer and clear screen.

Open **CEL** Select **STRETCH**  
Click **screen** Move cursor

Displays cel surrounded by marquee box.

Click outside lower-right corner of marquee box and move cursor until status line reads 296% X, 296% Y.

Click **screen**

Sets interim dimensions.

Click **screen** Move cursor

Click to right of marquee box and move cursor until status line reads 400% X, 296% Y.

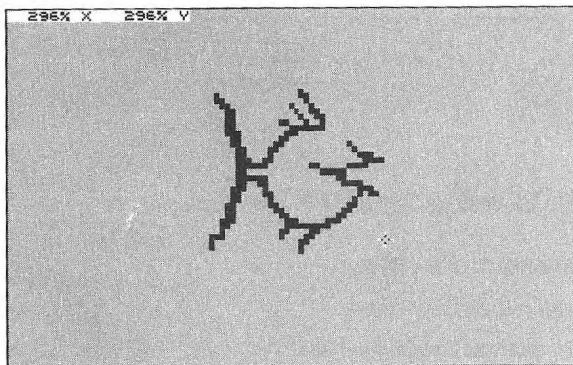
Click **screen** Right click **screen**

Sets latest dimensions and pastes cel.

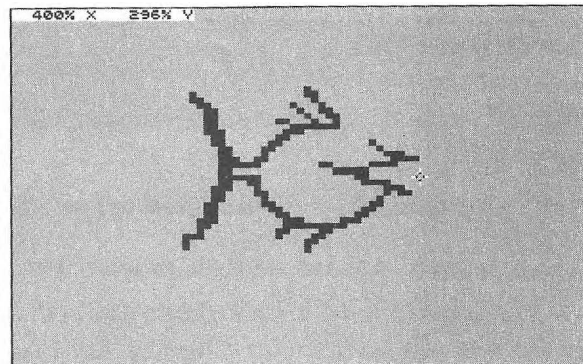
Type **sc**

Clips image to swap screen.

Save as FISH01.GIF picture file in the \AA\IN directory.



Tripling Height and Width of Cel



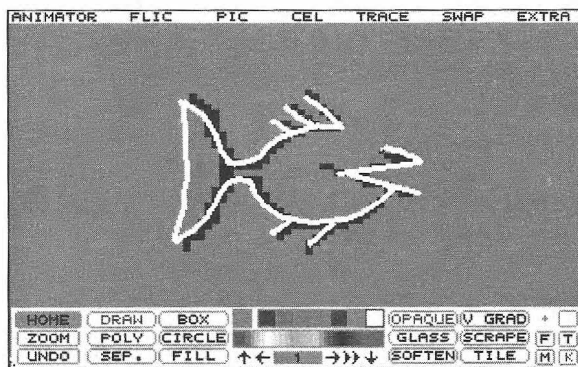
Further Increasing Width of Cel

The fish is now approximately three times taller and four times wider than it was originally.

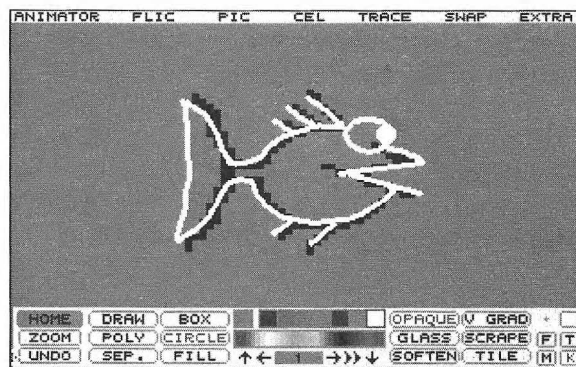
**TIP** To enlarge an image by doubling both the X and Y dimensions, you can select **EXPAND X2**, one of the special effects options when you select **EFFECTS** on the **FLIC** menu. **EXPAND X2** softens the image somewhat, so the effect on the enlarged image is not the same as stretching it.

### Drawing the Fish

The fish is now a good size, but you need a simpler, more streamlined shape to smoothly blend into the polygon. You'll trace such a shape over the original image, as shown in the illustration, using a size 3 brush and a different color. Then you can remove the original image with the separate tool.



Streamlined Shape Drawn Over Original Fish



Eye Added With Circle Tool

### Drawing the Fish



You can skip to the section, *Preparing Polygons*.



Continue from previous exercise, or load FISH01.GIF and set key color to blue background.

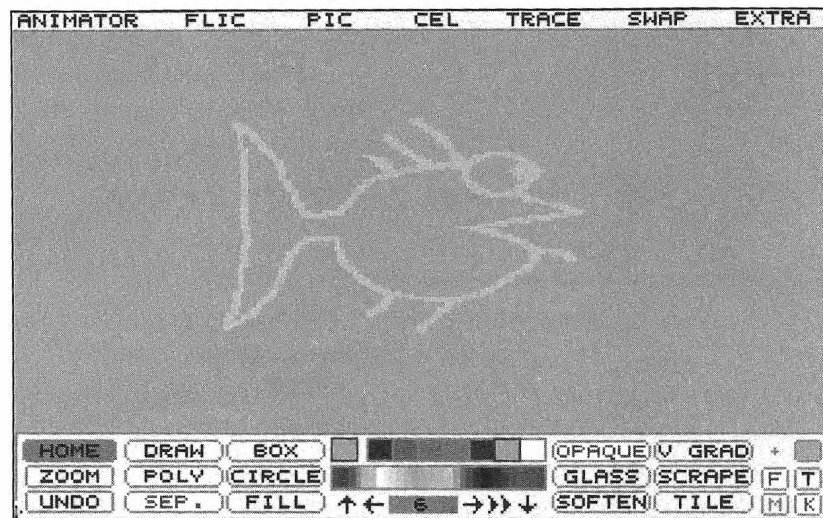
Change to size 3 brush and select golden yellow from cluster as current color.

Use **DRAW** and **CIRCLE** to trace shape of fish in golden yellow, as illustrated.

**Click key color** Selects key color as current color.

Use **SEP.** tool or **SEPARATE** on **PIC** menu and click on black anywhere on screen to remove original stretched fish.

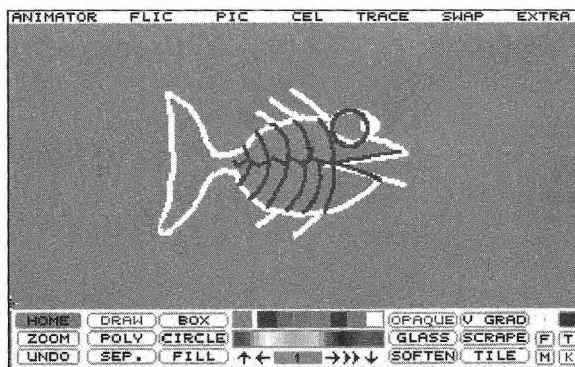
Clip drawing to swap screen and save as FISH02.GIF.



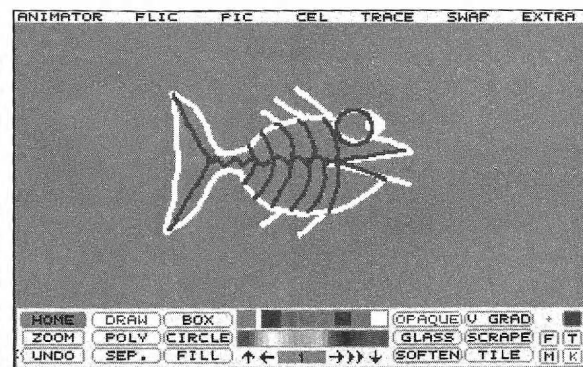
*Fish Drawn, Original Removed*

### ***Drawing the Skeleton***

The second drawing you need is the skeleton, which will be added after the end polygon of the tweening. In the next exercise, you'll draw the skeleton over the fish in a different color and then remove the fish with the separate tool. Then, you'll change the skeleton to the same golden yellow color as the fish. If you draw some lines you want to erase, you can use the scrape tool to restore that part of the original from the swap screen.



*Drawing the Skeleton Over the Fish*



*The Skeleton Drawn*

## Drawing the Skeleton



You can skip to the next section, *Preparing Polygons*.



Continue from previous exercise, or load FISH02.GIF and set key color to blue background and brush to 3 pixels.

Select dark blue as current color and draw skeleton as illustrated.

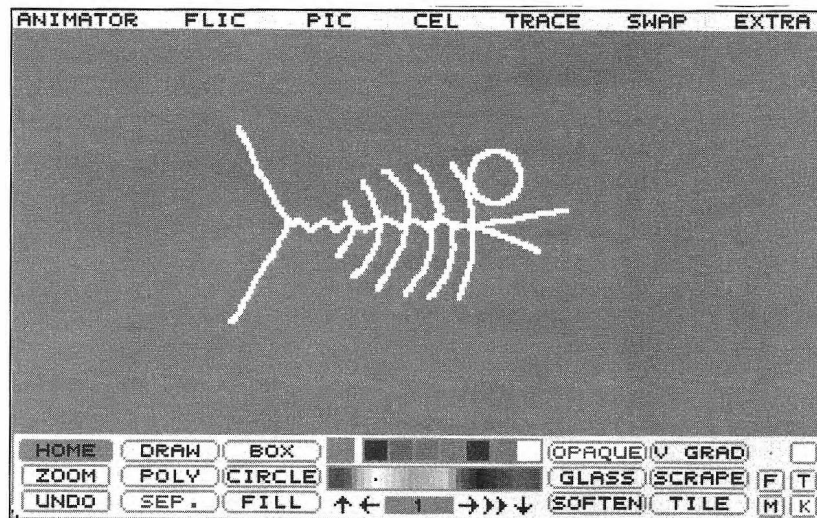
Select key color as current color and use separate to click on golden yellow anywhere on screen to remove fish.

Select golden yellow as current color and use separate to change dark blue to golden yellow.

Clip skeleton to swap screen and save as FISHSKEL.GIF.

---

You've now prepared the drawings from which you'll create the start and end polygons for tweening.



*Skeleton Drawn, Fish Removed*

## Preparing Polygons

In this section, you'll create the start and end polygons using the poly tool. You'll trace over the drawing of the fish, keeping track of how many times you click, so that you know how many points are in the



polygon. Then you'll do the same with the skeleton drawing, making sure to click no more than you did for the fish. You'll save each polygon in a polygon file.

### ***Creating the Start Polygon***

How Animator repositions points from the start polygon to the end polygon is often unpredictable. The fish tweening works better if you start at the top of the tail, go over the top of the fish to the head, work around the eye and continue around until you end up back at the top of the tail where you started. Turning off the closed option for the poly tool and closing the polygon yourself seems to improve the tweening.

**TIP** *You may find that the unpredictable way that points in the start polygon become points at the end introduces an interesting randomness of shape. The effect would be hard to create by hand.*

The poly tool is like a cross between the draw tool and the line tool. Each time you move the cursor and click, you draw a straight line. You continue drawing connected straight lines until you right click to end the procedure. Although the fish has curves, it is easier to use the poly tool than the spline tool for this drawing. To give the impression of a curve, draw several small straight lines. Be sure to draw the entire fish with a single polyline.

The example was done with about 60 points. There's no magic number, as long as the fish polygon has more points than the skeleton polygon. You'll need a lot of points for the skeleton, so put in more points than are absolutely necessary for the fish. If you lose track of the number or want to start over, right click and select UNDO.

**NOTE** *When you save a polygon file, you are not warned when it overwrites an existing filename.*

---

### **Creating the Start Polygon**



Load IN11FISH.GIF



Load FISH02.GIF.

Make sure brush size is 3 pixels and select orange as current color.

Right click **POLY**

Turn off closed and filled options on drawing tools panel.

Return to home panel.

Use **POLY**

Count the points while tracing the fish as a single polygon with a series of short lines; then right click to set the polygon.

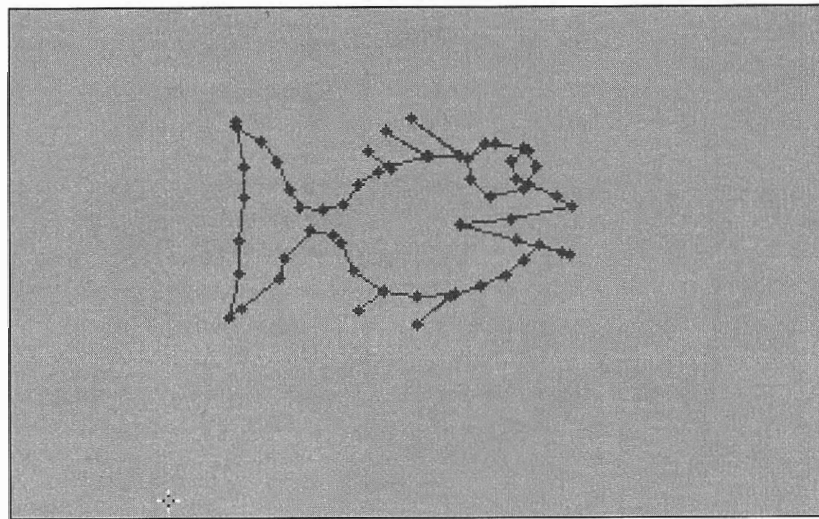
Right click **POLY** Click **FILES**

Save the start polygon as FISHPOLY.PLY.

---

The fish polygon is now the current polygon in the buffer. Because you've saved it, you can go ahead and create the skeleton polygon, which will then replace the fish as the current polygon.

**TIP** *Although the poly tool's reuse option is intended for pasting the current polygon, you can also use it to just view the contents of the polygon buffer by using UNDO after pasting it. Wherever you clicked when creating the polygon, the points appear as diamond-shaped nodes. If you want to alter and paste it, you can click on any node, move the cursor, and click again to set an adjusted position. Right clicking pastes it.*



*Viewing the Fish Polygon With REUSE*

### ***Creating the End Polygon***

Next, you'll create a polygon from the skeleton drawing that can serve as the end polygon for the tweening. Using the poly tool, you'll trace

around the skeleton. Starting from the top of the tail again, draw the lines for the backbone and upper skeleton first, draw around the head and eye socket, and retrace along the backbone to draw the lower skeleton on your way back to the tail.

Keep count of the number of points. Remember, the tweening won't work unless the end polygon has the same or fewer points than the start polygon. Orange should still be the current color.

---

### Creating the End Polygon



Load IN11SKEL.GIF.



Continue and paste skeleton drawing from swap screen, or load FISHSKEL.GIF.

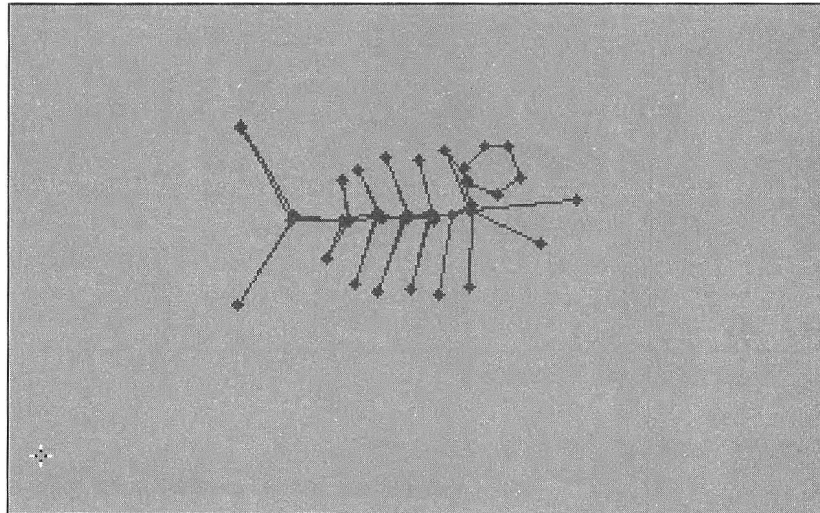
Make sure orange is current color, and that closed and filled options for poly tool are off.

Use **POLY**

Trace the skeleton with a single, continuous series of short lines, and right click to set the polygon.

Right click **POLY** Click **FILES** Save the end polygon as SKELPOLY.PLY.

---

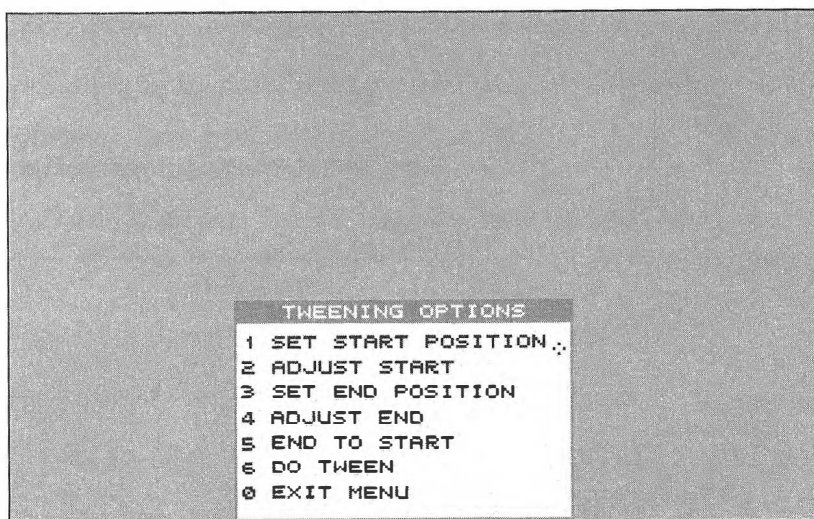


Viewing the Skeleton Polygon With REUSE

## **Tweening the Polygons**

Tweening the fish polygon into the skeleton polygon goes quickly once all of the preparations are made. In the following exercise, you'll display the TWEENING OPTIONS submenu by selecting TWEEN from the poly tool options. Then you'll load FISHPOLY.PLY, set it as the starting polygon, load SKELPOLY.PLY, and set it as the end polygon. Because the polygon files are ready to be used as is, you won't need to adjust either position.

Before beginning, you'll change the current color back to the golden yellow of the fish and skeleton drawings. In the final exercise in this chapter, you'll blend the fish and skeleton drawings into the tweening at the beginning and end of the flic.



*TWEENING OPTIONS Submenu*

---

### **Setting Start and End Positions**

Make sure key color is light blue from mini palette.

*Type x*

Clears screen leaving light blue background.

*Click cluster*

Select golden yellow as current color.

*Right click POLY Click FILES*

Load FISHPOLY.PLY and return to drawing tools panel.

Make sure filled and two color options are off.

Click <b>TWEEN</b>	Displays <b>TWEENING OPTIONS</b> submenu.
Select <b>SET START POSITION</b>	Displays fish polygon with nodes.
Right click <b>screen</b> twice	Sets fish polygon as start position and returns you to drawing tools panel.
Load <b>SKELPOLY.PLY</b> and return to drawing tools panel.	
Click <b>TWEEN</b>	
Select <b>SET END POSITION</b>	Displays skeleton polygon with nodes.
Right click <b>screen</b>	Sets skeleton polygon as end position and returns you to <b>TWEENING OPTIONS</b> submenu.

---

You don't need to set the start position first and then the end position. As you may have observed, the skeleton polygon was the current polygon in the polygon buffer at the end of the previous exercise. Another way to have set the two polygons for the tweening would have been to set the end position first, using the current polygon (the skeleton). Then, you would have had to load the polygon file of the fish to set it as the start position.

Or you could have made the frames for your flic first and simply set the start position immediately after drawing the fish polygon on frame 1 and set the end position after drawing the skeleton polygon on the final frame.

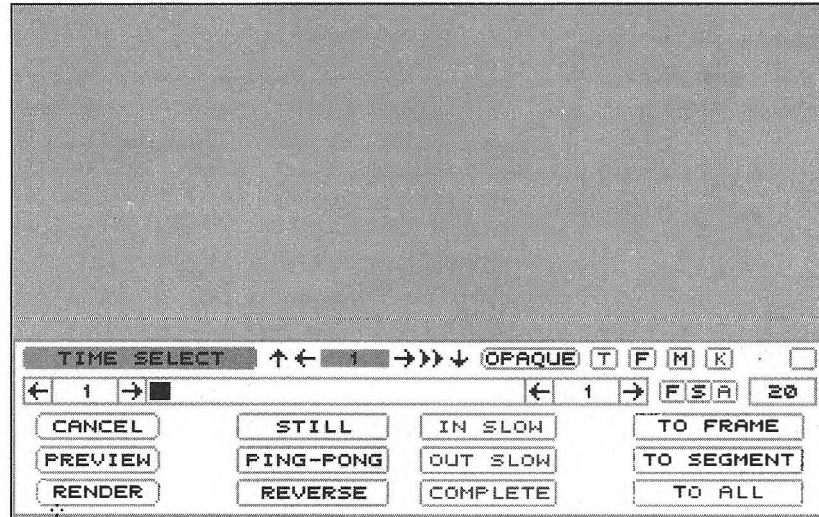
The other options on the **TWEENING OPTIONS** submenu let you reuse polygons for tweening once they're set as the start or end position. To pick up and move any points on the start polygon, you would select **ADJUST START**. To pick up and move any points on the end polygon, you'd select **ADJUST END**. In both instances, the polygon would be displayed with its nodes for you to make any changes. You would click near a point to move it, click again to set it, and right click to set the changes. After setting an end polygon, you can reverse its position, setting it as the start polygon by selecting **END TO START**.

**TIP** Use **ADJUST START** and **ADJUST END** (without making any changes) to view the current settings.

### ***Creating the Tweening***

Next you'll select **DO TWEEN** from the **TWEENING OPTIONS** submenu. The time select panel is displayed automatically; from there you'll go to the frames panel and create 20 frames. Back at the

time select panel, you'll turn on IN SLOW and OUT SLOW to slow down the movement at the beginning and end of the flic, respectively. Then you'll preview the results.



*Time Select Panel Set for Tweening*

If you see the need to change one or both polygons after previewing the tweening, you can do so with ADJUST START or ADJUST END on the TWEENING OPTIONS submenu.

---

## Rendering the Tweening

Continue from previous exercise.

Click **DO TWEEN**

Displays time select panel.

Right click on any frame icon to display the frames panel, set 20 frames for flic, and right click screen to return to time select panel.

Make sure brush size is set to 3 — the icon is next to the current color slot on time select panel.

Click **IN SLOW** Click **OUT SLOW**

Sets slower speed for start and end of flic.

Click **PREVIEW**

Plays tweening through once so you can check it.

Right Click **SCREEN**

Displays time select panel.

Click **RENDER**

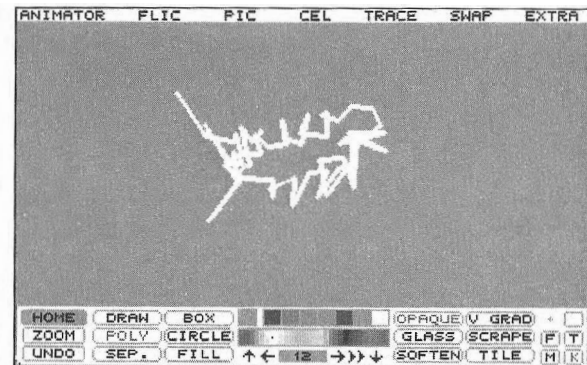
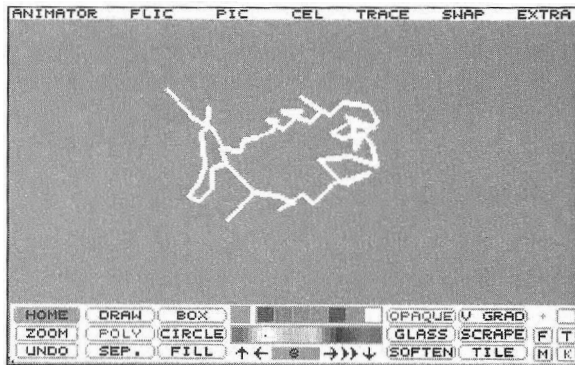
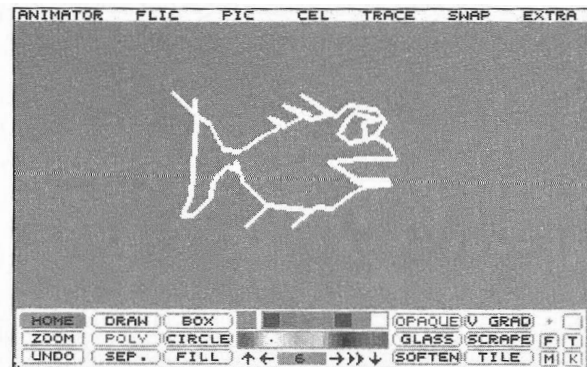
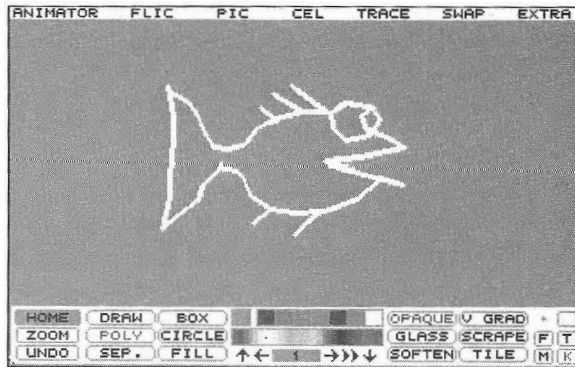
Renders flic and returns you to TWEENING OPTIONS submenu.

Return to home panel, play the flic, and save it as FISHSKEL.FLI.

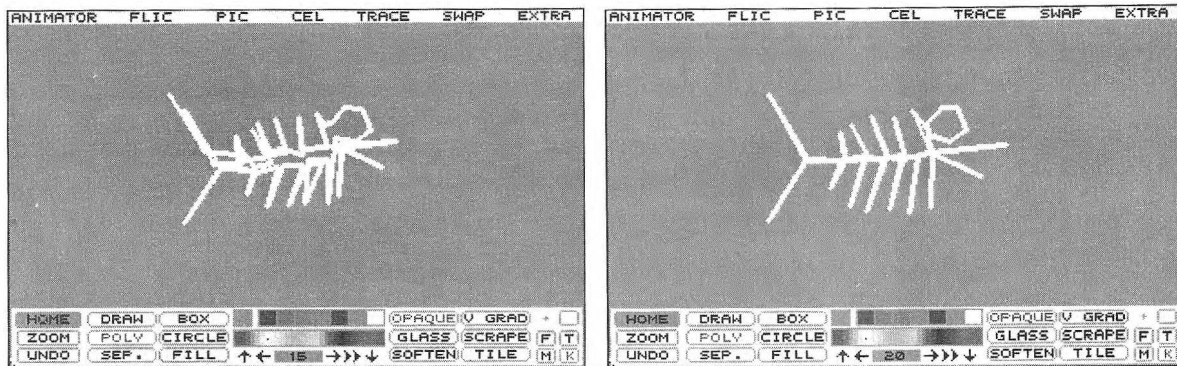
---

Now you have a flic of 20 frames in which the fish turns into the skeleton. As you play the flic, notice what effect IN SLOW and OUT SLOW have.

Each frame now simply contains a picture. You can use the drawing tools for any changes you'd like to make after rendering the flic, just as you would to any other picture.



*Tweening the Polygons*



*Twining the Polygons*

**TIP** *It's a good idea to make more inbetweens, rather than fewer, to give yourself more choices for editing later. It takes less time to make more frames the first time you render a twining than to go back several times and redo it. You can always delete extra frames.*

## Blending the Drawing With the Twining

The final exercise in this chapter blends the fish and skeleton drawings with the start and end polygons. You'll insert the fish drawing at the beginning and the skeleton drawing at the end of the flic, making duplicate copies of each to accentuate the effect of a slow in and slow out.

---

## Blending Drawings and Polygons

Continue from previous exercise, or reload FISHSKEL.FLI.

Display frame 1 of FISHSKEL.FLI.

Right click frame control icon

Click **INSERT**

Inserts a duplicate of frame 1 as new frame 2.

Load FISH02.GIF or IN11FISH.GIF on frame 1, replacing duplicate first frame of start polygon.

Click **down arrow frame icon**

Displays last frame of flic, now frame 21.

Insert one frame after frame 21 and display frame 22.

Load FISHSKEL.GIF or IN11SKEL.GIF on frame 22.

Play the flic, then save it under the same name, FISHSKEL.FLI.

---



**MORE** *Try painting the fish, drawings and inbetweens both, with one of the gradient inks. You might also outline the images again with the edge tool.*

## Finishing Touches

Depending on the complexity of your polygons and the quirkiness of polymorphic tweening, you'll probably need to clean up the images after the flic is rendered. Cleaning up may include erasing and redrawing parts of the inbetweens. You'll want to paint the inbetweens as well as the original drawings.

When you've finished cleaning up and painting the images, you can adjust the timing. Experiment with different play speeds, duplicating frames and adding holds as you do for other kinds of sequences. The speed should, of course, be appropriate for the subject. Decide whether you want to emphasize the changing or the result of the change. For example, a sequence in which a mermaid turns into a human might dwell on the metamorphosis itself for drama and emotional impact. On the other hand, an animation in which a magic wand taps a cereal box and turns it into sparkling honeycombs would go through the change very quickly.

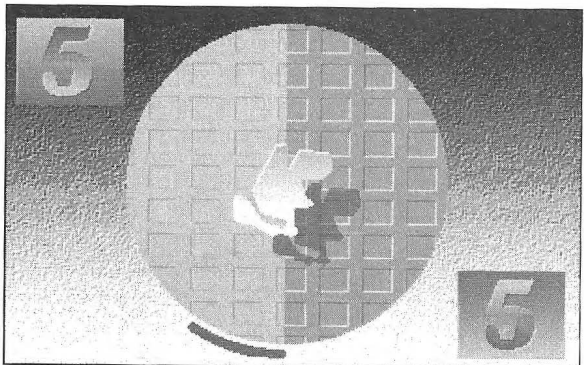
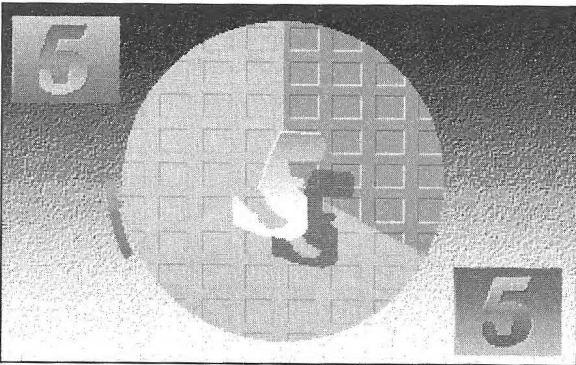
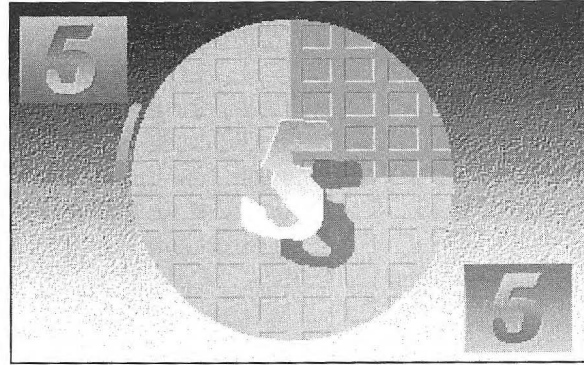
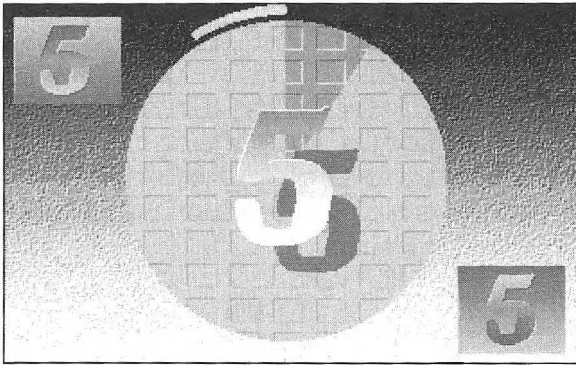
## Other Examples

The illustration at the beginning of this chapter is from the opening of Robert Quinn's "Countdown," an animation totalling more than 100 frames. In witty, sophisticated style, the animation conveys the illusion that the number ten is transformed into a nine, the nine turns into an eight, and so on through the countdown.

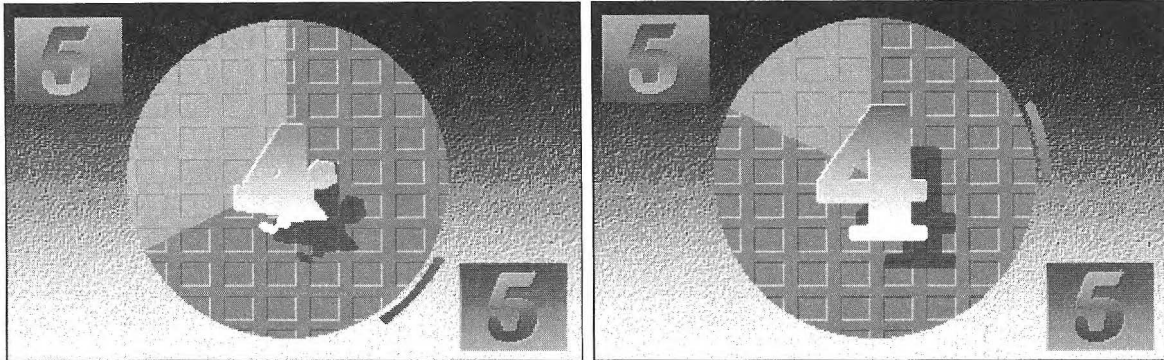
Here are six more frames from "Countdown," showing in detail the metamorphosis from the number five to the number four. After tweening, the individual frames were cleaned up and carefully edited by hand.

In addition to the metamorphosis, notice the variety of other visual effects. Jumble and emboss ink cover most of the screen area with an interesting texture. The central area which serves as a contrasting backdrop to the shifting shapes of the numbers is tiled and embossed. The suggestion of a sweep second hand moving in short segments

around the number is color cycled, and gradients fill the four smaller numbers at each corner of the screen.



*"Countdown"*



*"Countdown"*

**NOTE** *You can now delete the FISH01.GIF, FISH02.GIF, FISHSKEL.GIF, FISHPOLY.PLY, and SKELPOLY.PLY files, which are no longer needed.*

## Next Steps

The flic you've created in this chapter will be used again in Chapter 13, where it becomes part of the sequence extolling the pleasures of deep-sea fishing at Club Baltic. It's included on the IN DISK as IN11FSKL.FLI.

In the next chapter, you'll create several optical illusions that will also be incorporated into the Club Baltic animation.



*A Flipping Optical Illusion*

# Optical Effects

Creating optical effects is, for many people, the main appeal of computer animation. It's the pizzazz of intricate flips and turns, spins and twists, obliterating the barrier of the flat two-dimensional drawing plane. In movies, optical effects make possible the flash of speed as the spaceship hurtles out into the next galaxy and beyond. Less spectacular optical effects — but more likely to occur in daily experience — are illusions such as a logo spinning around a globe, a pump pumping, or a building looming on the horizon.

Animator provides a wide variety of optical effects, from simple automatic movements to extremely complex combinations you design and adjust manually. The power and flexibility of the options on the optics panel rival much more expensive professional systems. But how to unleash that power is not immediately self-evident. As you might expect, the better you understand the manual adjustments that can be made, the more sophisticated the results you can achieve.

The optics panel and its menus were introduced in earlier chapters. In Chapter 5, the fish leaped out of the pond courtesy of the path option on the optics panel. The truss receded into the distance in Chapter 7 via an automatic pullback. This chapter covers three optical effects that are incorporated into the Club Baltic animation. For the first illusion, you'll flip a framed picture of the beach at twilight. For the second illusion, you'll send a large yellow tennis ball spinning across and off the screen on a spline path. The last illusion puts a seagull on a clocked path, producing a movement that appears to be more spontaneous than the others.

## The Illusion of 3D

Animator exploits the computer's power to process and translate images so rapidly that they seem to move in a three-dimensional universe. But it is not a 3D program. A full 3D program models objects

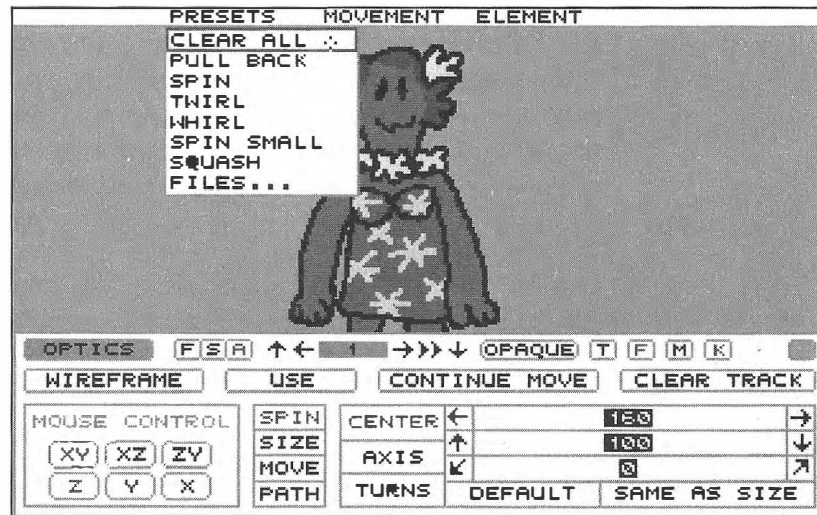
in three dimensions, precisely locating each point along the X, Y, and Z axes of a coordinate system.

In Animator, you create the illusion of 3D with options such as the automatic pullback, which simulates movement back or forward along a Z axis. These sorts of illusions are called *ADO* effects, referring to a pioneering graphics device for creating them. Objects, however, remain flat. There's no back to a figure, and no side edges to the letters in a title.

Chapter 14 discusses how to bring true 3D drawings modeled in AutoCAD and rendered in AutoShade into Animator.

### ***Automatic Optics Movements***

Animator provides six automatic optics movements on the PRESETS menu of the optics panel. They are PULL BACK, SPIN, TWIRL, WHIRL, SPIN SMALL, and SQUASH.



*PRESETS Menu for Automatic Optics Movements*

Viewing the effects of the various automatic movements can help you become familiar with the way Animator handles two-dimensional images to give the illusion of three-dimensional movement. Both PULL BACK and SQUASH alter an element's X and Y dimensions. PULL BACK reduces both dimensions, while SQUASH reduces one while stretching the other. Each of the remaining movements rotates

an element once around one axis: SPIN and SPIN SMALL around the Z axis, TWIRL around the X axis, and WHIRL around the Y axis. SPIN SMALL is an example of a compound movement, a spin and a pullback applied at the same time, so that an element shrinks while spinning, thus appearing to spin back along the Z axis.

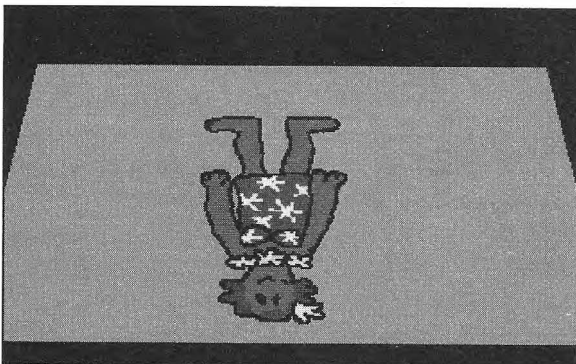
**MORE** *If you're not accustomed to moving, turning, and flipping objects, it's a good idea to spend some time trying out the automatic optics movements on the PRESETS menu. Take one cel or picture, select SPIN, TWIRL, and WHIRL on the PRESETS menu and compare the results in wireframe over 20 frames. Then preview each option and compare the different effects on the image.*



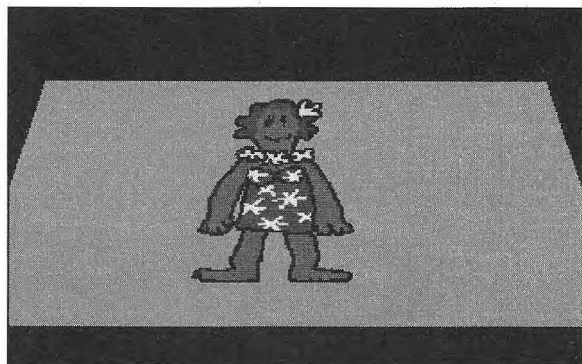
Two-Dimensional Image Spinning on Z axis



SPNA/SPNB

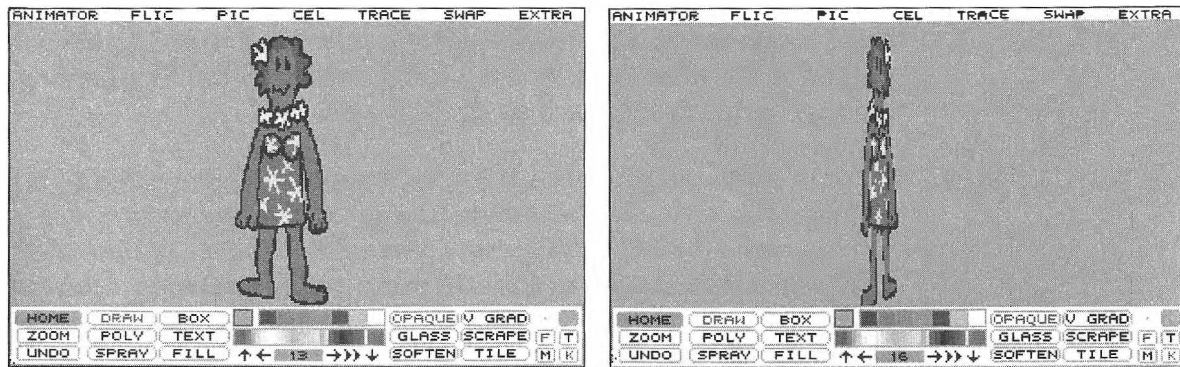


Two-Dimensional Image Twirling on X Axis



TWRA/TWRB





Two-Dimensional Image Whirling on Y Axis

WHRA/WHRB

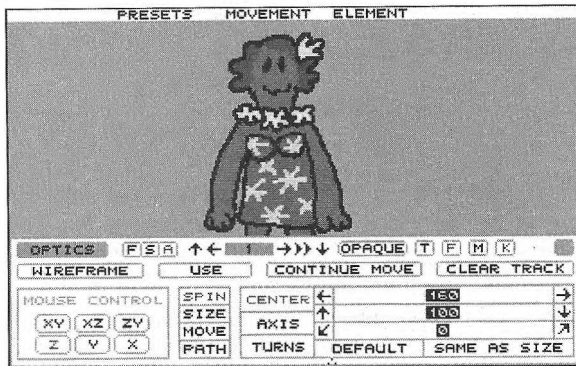
### ***Specifying Movements***

There are three ways to manipulate an element for an optical effect. One way is to select an automatic movement on the PRESETS menu, described in the previous section. Another way is to select the *mouse control buttons*. These are located on the lower left of the optics panel, one for each axis and for each combination of two axes. Using the mouse, you can make the cursor move an element along one or two axes, corresponding to the button that is highlighted. The third way is to adjust the various sliders for the four optics movements on the optics panel: SPIN, SIZE, MOVE, and PATH. You can also combine these choices to apply complex movements to an element.

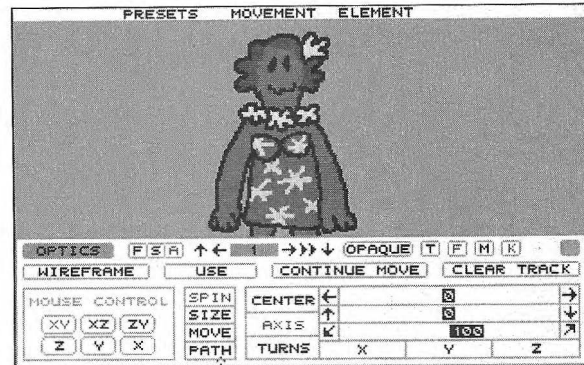
The slider bars on the optics panel can be confusing at first. Depending on which movement is selected, the slider bars represent different information. When SPIN CENTER is selected, the sliders set the intersection of the X, Y, and Z axes, the point around which the spin occurs. But SPIN CENTER also sets the center point for objects you manipulate with SIZE, MOVE, and PATH. Moreover, SIZE CENTER is an alternative to SPIN CENTER; it also sets the center point for all four movements.

**NOTE** *Before adjusting any other settings, you should always select SPIN CENTER or SIZE CENTER and set the center of the element. To set the center, you can click on DEFAULT, which places the center at the geometric center of the element; or click on the screen, move the center icon, and right click to set it; or adjust the X, Y, and Z sliders.*





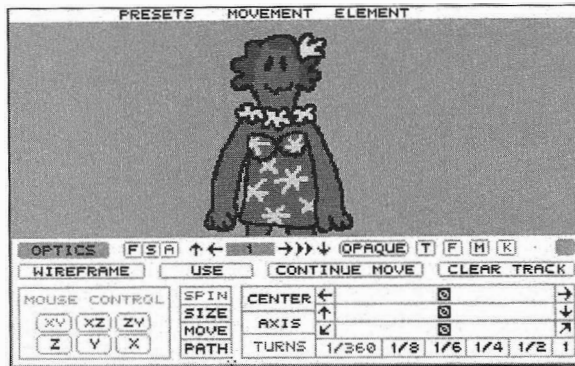
SPIN CENTER Sliders



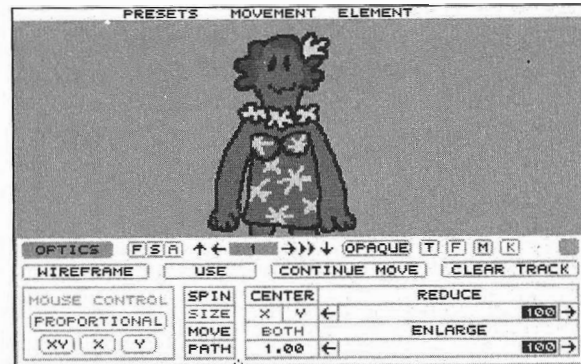
SPIN AXIS Sliders

When SPIN AXIS is selected, the sliders set the units to reorient the coordinate system used in Animator. You would reorient an axis to spin an element about a diagonal axis. The default setting is  $X = 0$ ,  $Y = 0$ ,  $Z = 100$ . That is, the X axis is horizontal, the Y axis is vertical, the Z axis runs through the back of the monitor, and the three axes intersect 100 units back from the center of the screen. The X, Y, and Z options at the bottom of the sliders offer automatic resetttings: selecting X reorients the axes to 100,0,0; selecting Y reorients them to 0,100,0; and selecting Z restores the default setting of 0,0,100. You'll probably use the default 0,0,100 most often. For full information about the coordinate system this option uses, see the *Autodesk Animator Reference Manual*.

When SPIN TURNS is selected, the sliders specify the number of turns around the X, Y, and Z axes, further controlled by the turn increment options at the bottom of the sliders, which range from 1/360th (one degree) to one full turn (360 degrees). A positive slider number specifies a turn counterclockwise, a negative turn is clockwise. The actual number of turns is calculated by multiplying each slider value by the turn increment. For example, when 1/2 is the turn increment option highlighted and the Y axis slider is set to -3, the element rotates three half turns (spins 1 1/2 times) counterclockwise around the Y axis.



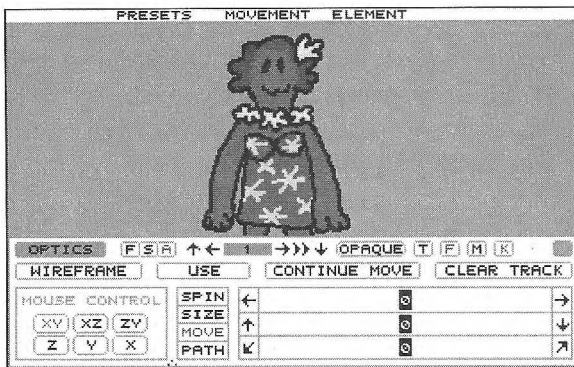
SPIN TURNS Sliders



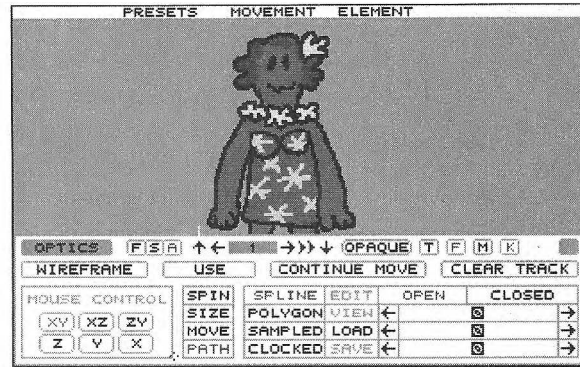
SIZE REDUCE and ENLARGE Sliders

You can reset the X and Y measurements of objects when SIZE is selected. Use the reduce and enlarge slider bars, which indicate the percentage of increase or decrease. Selecting X, Y, or BOTH resizes either or both measurements. As noted already, you can set the object's center when SIZE CENTER is selected.

The sliders for the X, Y, and Z axes reappear when you select MOVE. You can set one, two, or all three sliders to specify where in 3D space the element will end up after the move. The coordinate 0,0,0 for this option is the upper left corner of the screen. Movement along the X axis is measured from zero at the left edge of the screen to 319 at the right edge; distance up and down the Y axis is measured from zero at the top edge of the screen to 199 at the bottom edge. Distances along the Z axis are measured from zero at the screen to 500 units back from the screen or -500 units in front of the screen. Negative X and Y settings move the element off the left and top edge of the screen, respectively. Settings larger than the pixel dimensions of the X and Y axes (greater than 319 X and 199 Y) move the element off the right and bottom edge of the screen, respectively.



MOVE Sliders



PATH SPLINE Sliders

Another group of slider bars appears when PATH is selected. These adjust tension, continuity, and bias for spline paths. They are the same sliders that appear for the spline tool on the drawing tools panel. Learning to adjust these by trial and error can be tricky — see the spline tool section in the *Autodesk Animator Reference Manual* for diagrams and illustrations which explain how to use these settings.

**MORE** Try SPIN, TWIRL, and WHIRL first with the mouse control buttons and then by using the manual settings on the slider bars over ten frames for the same picture. Try a wireframe and then preview each movement.

It's possible in Animator, and often desirable, to apply more than one optical movement to an element over the same sequence. For example, to create the tennis ball illusion later in this chapter, you'll spin it, pull it back, and at the same time move it along a spline path. To do this, you'll specify each movement on the slider bars, rather than use the automatic movements or the mouse control buttons.

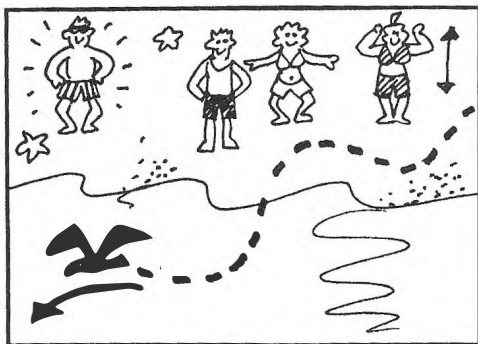
**TIP** When you are designing a compound movement, get each component right before adding to it. For example, if you are thinking of combining a spin and a clocked path movement, first animate an element spinning, then animate the same element on a clocked path. Finally, put the movements together.

## Planning Optical Effects

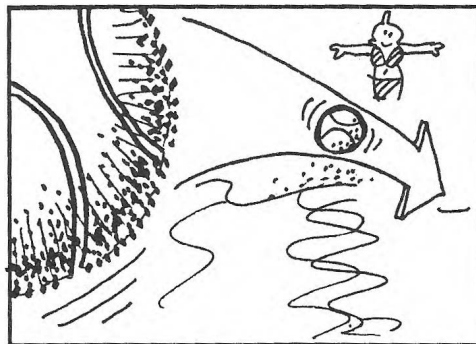
Once you've been introduced to the power and sheer fun of creating optical effects, it's tempting to overdo the effects — spinning and flipping too many elements while ignoring the opportunity to focus and dramatize the main subject or point of the animation. Your optical effects will turn out better if you plan them at the storyboard and layout level.

It's important to plan how a particular movement fits into the layout, especially when a moving element is to be created separately and then combined with other elements. The storyboard for the Club Baltic animation indicates that the tennis ball is going to move across the screen and briefly cover the exercising characters. The seagull is going to take a path that also appears to be in the foreground of the scene, but leaves the actions of the characters visible. These sorts of relationships should be taken into account when planning an animation. The tennis ball will need to be much larger than the seagull, and the ball's path should end far enough in the foreground that the exercisers are again visible. On the other hand, the seagull must remain small so that it doesn't block the background action while flying over the water.

**TIP** *In general, plan to start with a large image and reduce it. Enlarging a small image emphasizes Animator's low resolution. When you need to create the illusion that an image is growing larger, do it backwards: reduce a large image, then save it in reverse with BACKWARDS on the FLIC menu.*



*Flying Bird Illusion in Storyboard*



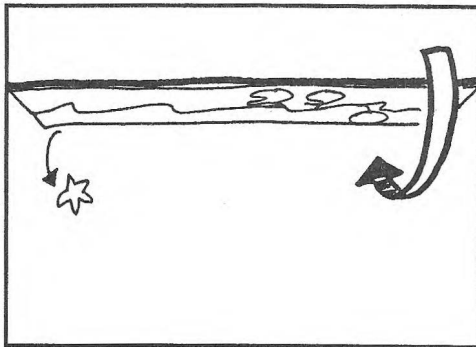
*Tennis Ball Illusion in Storyboard*

In designing your own projects, you can invent optical effects that defy the laws of physics. Tennis balls can boomerang. People, trucks, and giant broccolis can fly. For the most part, unless you're aiming at a bizarre or comic effect, you should consider how an object actually might move. Even if you aren't trying to be realistic, a large object probably shouldn't spin faster than a small one in the same sequence. Try to imagine how a slab of granite would actually flip, or how a head of broccoli would, in fact, fly.

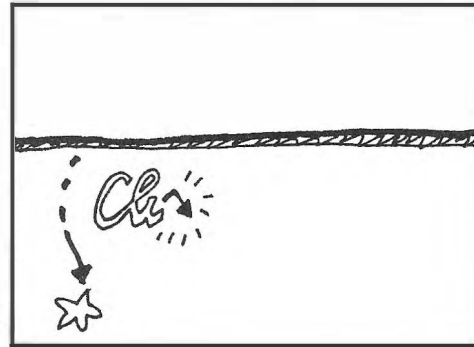
**TIP** *If you're moving many elements, it's sometimes preferable to use similar movements on each and merely vary their paces. Having one element spin quite fast and another spin very slowly creates a compelling pattern.*

## Flipping a Scene

Near the end of the Club Baltic animation, the couple stands on the beach facing us, holding hands at twilight. The scene flips up and back, until it is an edge-on horizontal view reduced to a straight line. While the scene is flipping, a starfish falls off the beach into the void. In the final sequence, the line turns into the Club Baltic logo write on and the starfish imitates the characters exercising on the beach.



Scene Flipping in Storyboard



Starfish Falling

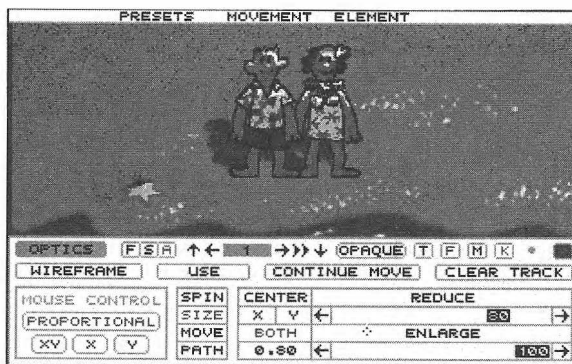
This section demonstrates how to achieve the illusion that the scene is flipping over to become a straight line. After loading the picture of the beach scene, you'll create 36 frames for the sequence. Then you'll select a marine blue color and a four-pixel brush for a border, which will make it easier to see the movement.

**MORE** *If you would like to follow the storyboard more closely and you are working with COUPLEF.GIF, tint the scene before beginning the exercise to flip the scene. A 30 percent medium gray tint gives the impression of twilight, but you can experiment until you get an effect you like.*

On the optics panel, you'll select OUTLINE from the ELEMENTS menu to place the border around the scene and check the center with SIZE CENTER. Next, you'll resize the scene using the sliders, so that there's some space outside the border while the scene flips. To complete the movement, you'll set SPIN TURNS to rotate the scene one-quarter of a turn back, spinning clockwise around the X axis.



Setting the Center of the Flic Element



Reducing Both X and Y Size 80 Percent

If you have the IN DISK, you can load IN12CPLF.GIF. The IN DISK file is a more elaborate version of COUPLEF.GIF (the scene you created in Chapter 8), which shows the guy and gal on the beach facing front.

## Making a Flipping Scene

Type **fry**

Y Load IN12CPLF.GIF.

N Load COUPLEF.GIF.

Create 36 frames on frames panel and return to home panel.

*Move cursor Press <f1>*      *Select* ocean blue from screen as current color, for border.  
*Click brush*                      Toggles to size 4 brush for border around scene.  
*Type opc*                          Displays optics panel and selects CLEAR on PRESETS menu to clear all preset optics settings.

*Open ELEMENT Select OUTLINE*      Asterisks appear beside FLIC and OUTLINE, indicating border will be drawn around default element, FLIC.  
*Click SIZE Click CENTER*              Displays slider bars for setting center.

Check that center icon is in center of frame by clicking on screen, and right clicking to return to optics panel. If not correct, click DEFAULT below slider bars.

*Click BOTH*                          Displays slider bars for reducing or enlarging object.  
*Drag reduce slider*                      Set percent of reduction to 80.  
*Click WIREFRAME*                      The wireframe grows smaller over range of frames.  
*Click USE*                              Displays time select panel.

Preview movement and right click twice, returning to optics panel to add spin before rendering.

*Click SPIN Click TURNS*              Displays 3 sliders and rotation options to spin element around X, Y, and Z axes.  
*Click 1/4*                              Sets 1/4 of 360 degrees as the increment per slider unit to turn the scene.  
*Drag X slider*                          Set topmost slider to -1, for 1/4 turn moving back around X axis.

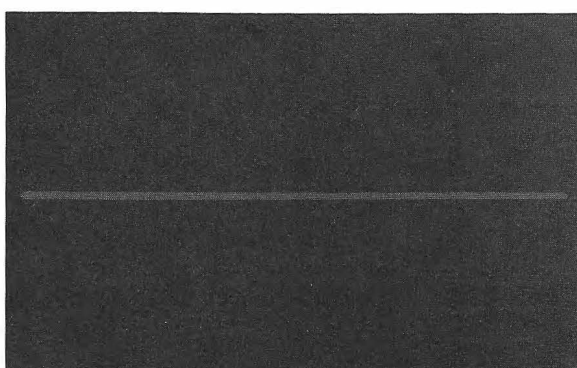
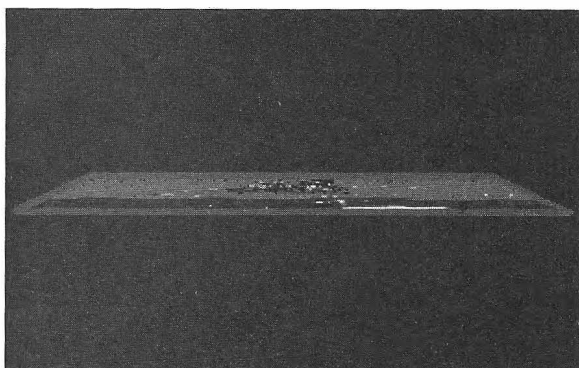
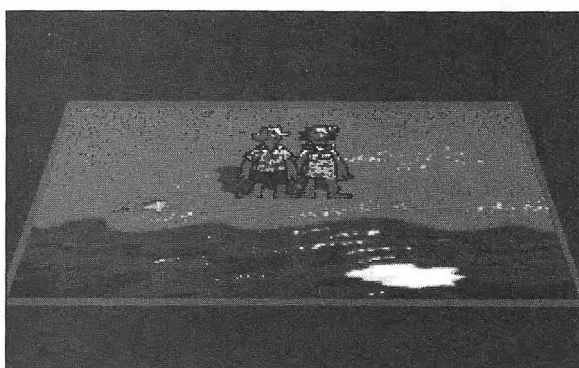
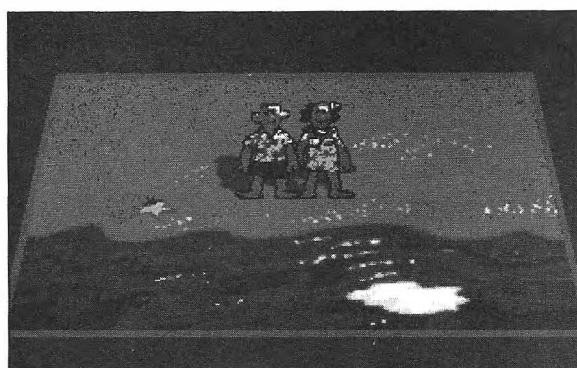
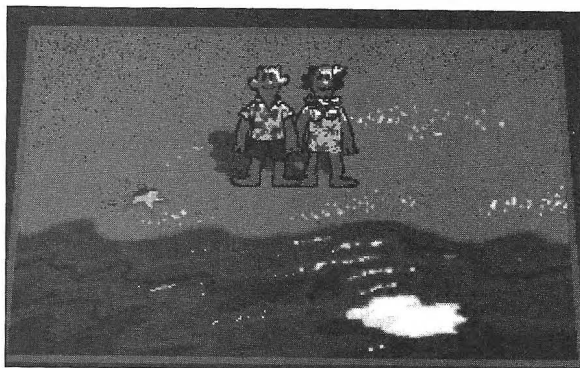
Check the wireframe and if OK, click USE and preview the movements on the time select panel.

*Click OUT SLOW*                      Decelerates the last frames of the flic.  
*Click RENDER*                          Creates the animation.

Play the flic, and save it as LOGO1.FLI.

---

Notice that the border maintains its four-pixel thickness even when the scene is fully laid back.



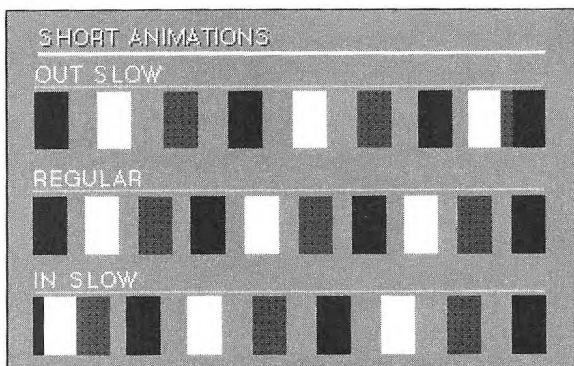
*Scene Flipping*



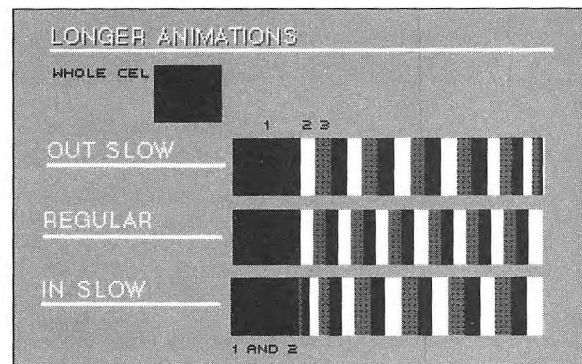
As you can see, the scene moves back while it turns, so that the final horizontal line is 80 percent of the original full screen width.

Another way to reduce the size is to move the flic back on the Z axis by setting the Z axis slider for the MOVE option. The Z axis is measured from zero to 500 units back from the screen. To reduce the size to 80 percent, you would set the Z axis slider to 100 (80 percent of the full 500 unit screen size).

**TIP** *Experiment with IN SLOW and OUT SLOW until you have a feel for the difference each makes. You can set these and other pacing options on the MOVEMENT menu of the optics panel as well as on the time select panel. The next diagrams illustrate the rate of change on the frames of a short flic and over a longer sequence.*



OUT SLOW/IN SLOW in Short Flics



OUT SLOW/IN SLOW in Longer Flics

**NOTE** *For regular pacing (the default, neither IN SLOW nor OUT SLOW), Animator places the cels equidistantly. When OUT SLOW is selected, Animator doesn't overlap the final cels' positions to cushion the end — it also places the initial cels farther apart. This means that the impression of acceleration may be created when you merely choose OUT SLOW.*

*For IN SLOW, the opposite is true. In addition to severely overlapping the initial cels (sometimes frame 1 and frame 2 are in identical positions), the final cels are placed farther apart. This may create a fairly abrupt halt to some animations.*

*How extreme the effect is of these byproducts of OUT SLOW and IN SLOW varies a great deal depending on the shape, size, length, and*

*trajectory of the animation. But some manual adjustments may be needed.*

## **Tennis Ball With Top Spin**

In the Club Baltic animation, the tennis ball precedes the “TENNIS” title while the exercisers perform their movements in the background. In this section, you’ll prepare the tennis ball’s optics movements. You’ll composite the tennis ball with the exercisers on the beach in Chapter 13.

For this illusion, you’ll draw a simple ball and position it partly offscreen so that it will seem to emerge suddenly at the beginning of the sequence. You’ll apply three movements to the sequence on the optics panel: a move back on the Z axis, a spline path, and a series of spins.

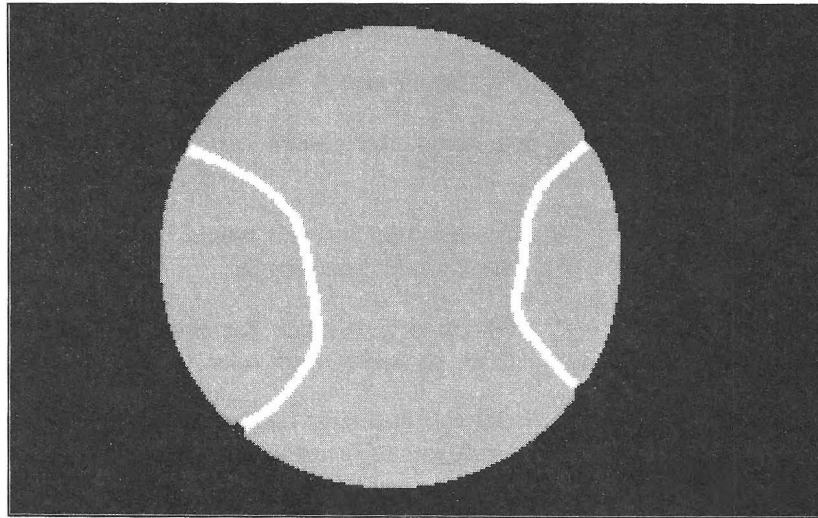
### ***Preparing the Cel of the Tennis Ball***

In the following exercise, you can just draw a circle to see how the optical effect works or, as in the illustrations, you can draw seams on the ball with the spline tool and make the ball look slightly fuzzy with soften ink.

**MORE** *In the illustrations, the seams have been cleaned up slightly at the edges using the draw tool and the background color with a single-pixel brush, so that the fuzz appears to extend farther. You might also apply a textured effect by lightly spraying the ball with a slightly darker color.*

First, you’ll select an amber color for the background. Then you’ll draw the tennis ball in yellow, soften it, and draw the seams. Amber will blend into the object at the edges, rather than the default black background. Otherwise, a harsh blackish edge would show up when you composite the tennis ball, as you’ll do in Chapter 13.

When the tennis ball is ready, you’ll change the background back to the default black key color in register zero and use CEL GET to make a cel of the tennis ball to be used as the element on the optics panel. With CEL MOVE, you’ll position the cel partly offscreen on the left, where the optics movements will begin.



*Tennis Ball Drawn and Softened*

## Preparing the Cel of the Tennis Ball

*Type* **fry**

Display palette panel.

*Click color matrix slot*      *Select* amber in slot 1 of row 4 (source 96) as current color.  
Return to home panel.

*Type* **pa**      Fills background with amber ink.

*Click cluster box*      *Select* bright yellow as current color.

On drawing tools panel, replace text tool with circle tool. Right click twice to return to home panel and display entire screen.

*Use* **CIRCLE**      *Draw* filled yellow circle nearly as large as screen.

Right click to display home panel again.

*Click* **SOFTEN** *Type* **pa**      *Apply* soften ink three times to make edges of tennis ball fuzzy.  
*Type* **sc**      Preserves original in swap buffer before you alter the image.

Click **mini-palette**

Select white as current color.

Click **OPAQUE**

Click **brush**

Toggles to size 4 brush.

Replace poly tool with spline tool from drawing tools panel. Turn off filled and closed options, and display entire screen again.

Use **SPLINE**

Draw white lines on tennis ball, as illustrated, and display home panel again.

Click **key color**

Selects default black key color as current color.

Click **FILL** Click **screen**

Click on background color to change amber to key color.

Press **<escape>**

Get cel, enclosing tennis ball as tightly as possible.

Type **sc**

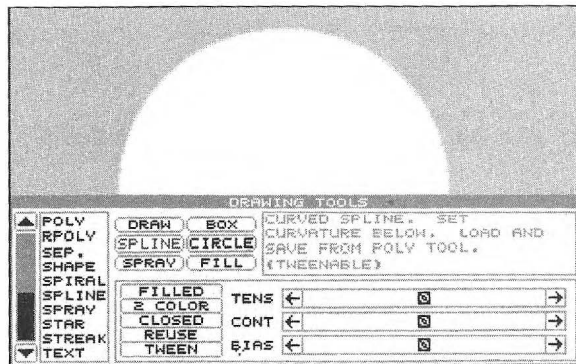
Updates image on swap screen.

Save cel as **TBALL.CEL**.

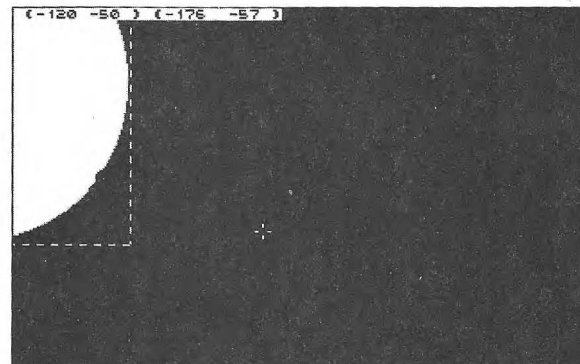
Type **x**

Open **CEL** Select **MOVE**

Pick up cel and move to upper left, partly offscreen, as shown.



Selecting **SPLINE** on Drawing Tools Panel



Moving Cel of Tennis Ball Partly Offscreen

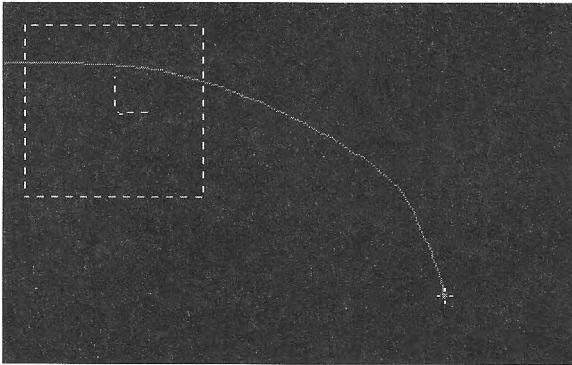
**TIP** Occasionally, **CEL CLIP** does not put the smallest possible rectangle around a large object, but leaves more space on one side. When this occurs, optic spins and spline movements can seem erratic because the program calculates the center of the rectangle, not the center of the object, as the center point. In such instances, use **CEL GET** to ensure that the center of the rectangle closely approximates the center of the object.

### *Creating the Optical Effects for the Tennis Ball*

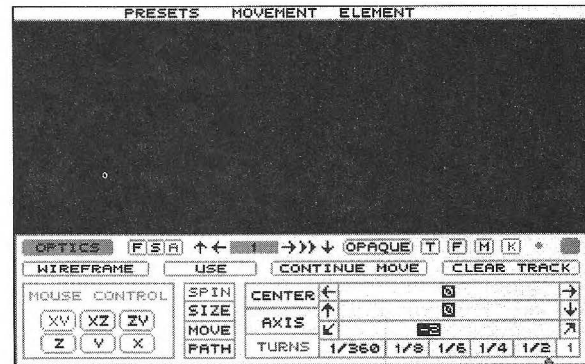
Now you're ready to go to the optics panel and move the spinning ball across the screen. To move the ball back along the Z axis, you'll select MOVE and set the Z axis slider bar. This movement is identical to the automatic pullback, except that you can specify a distance other than the automatic 500 units. Here it will have the effect of reducing the size of the ball as it lands in the ocean near the exercisers.

To put the ball on a spline path, you'll select PATH and use the default options, SPLINE and OPEN. Then you'll click on screen to start the movement, and click and move the cursor to change direction, just as with the spline and poly tools. If you like, you can experiment with changing the tension, continuity, and bias settings to produce various curves for the ball on its path.

**TIP** *If you put many points close together for a spline path, you may notice a sort of hiccup in the trajectory. Also, if you move the cursor up or down slightly off the path while drawing it, the object may seem to hover in place, especially at slow play speeds.*



*Drawing the Open Spline Path*



*Setting SPIN TURNS*

To put a spin on the ball, you'll select SPIN TURNS and set two full rotations around the Z axis. This will turn the ball as if it's a gymnast doing cartwheels.

You'll check movement as a wireframe and preview the effect on the time select panel. If it's not right, you can redo a movement by clicking on CLEAR TRACK at the upper right of the optics panel. To remove all the movements, you can select CLEAR ALL from the PRESETS menu.

If you get too bolluxed up to undo your settings, you can reset the program and position the cel again (resetting doesn't clear out the cel buffer or the swap screen).

---

### **Serving Up the Tennis Ball**

Continue from previous exercise, or reset the program and load **TBALL.CEL**.

On frames panel, create 36 frames for flic and return to home panel.

*Click mini-palette*                      *Select orange as current color, so spline path will be visible.*

*Type opc*                                      *Displays optics panel and clears optics settings.*

*Open ELEMENT Select CEL*                      *Sets cel as element for action.*

*Click CENTER Click DEFAULT*                      *Sets default to center of cel.*

*Click MOVE*                                      *Set Z slider (bottom) to 450.*

*Click WIREFRAME*                                      *The wireframe cel shrinks until it's fully visible on screen.*

*Click USE*                                      *Preview on time select panel and return to optics panel.*

*Click PATH Click SPLINE*                      *Click on screen and draw a spline curve from upper left edge to lower right of screen, as illustrated; right click to set path and return to optics panel.*

Check as wireframe and preview, correcting if necessary. The cel should shrink as it arcs from upper left to lower right.

*Click SPIN Click TURNS*

*Click 1*                                      *Sets rotation increment option for one turn per slider unit.*

*Drag Z slider*                                      *Set Z slider to -2, for two full turns clockwise around Z axis.*

Check as wireframe, correcting if necessary. The cel should spin and shrink as it arcs from upper left to lower right.

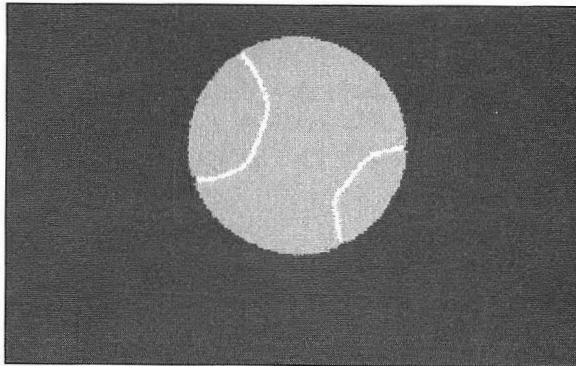
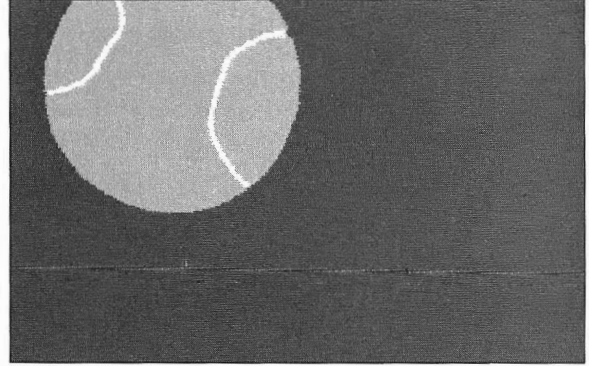
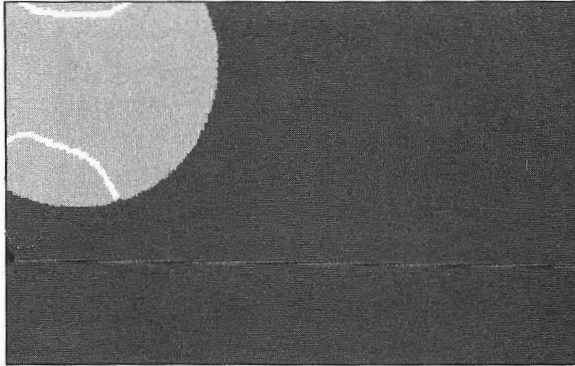
*Click USE*                                      *On time select panel, preview and render the flic.*

Play flic and save as **TBALL.FLI**.

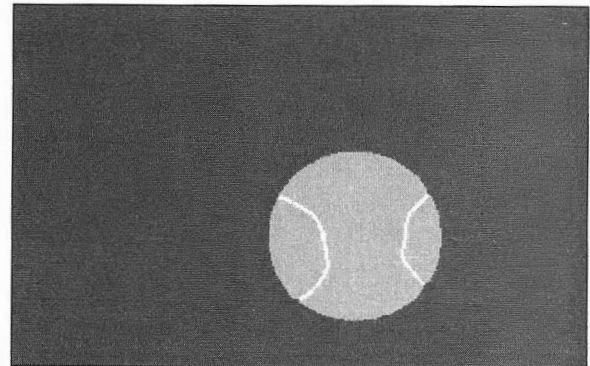
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Selecting cel as the element instead of flic (the default) does not automatically set the center point at the center of the cel. Whenever

you're in doubt about where the center is set, you can select SPIN CENTER and click on default, establishing the center as the center of the currently selected element. Then, you have a recognizable point of reference if you want to move the center.

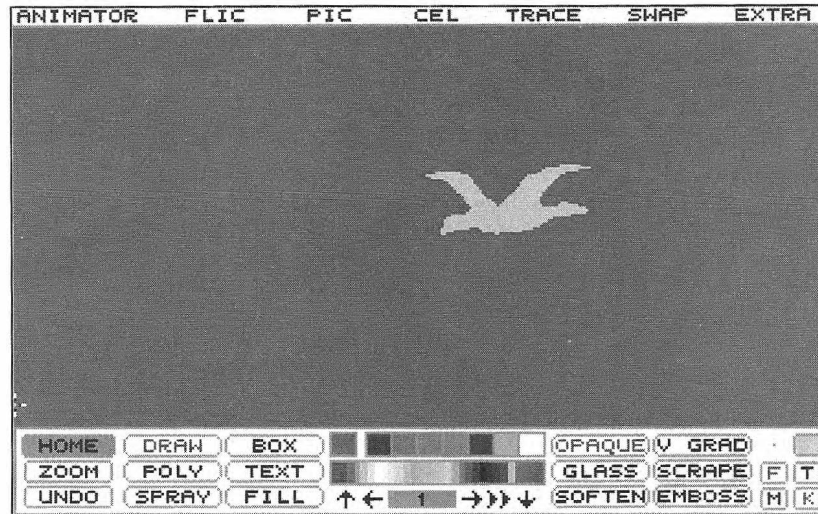


*Tennis Ball Hurtling Across Screen*



## Soaring Seagull

To create the illusion that the seagull is appearing in front of the exercisers on the beach, you'll also use a cel. But this time, you'll apply a combination of a clocked path and a move to swoop the cel from offscreen on the right to offscreen on the left.



*The Seagull*

### ***Drawing the Seagull***

The first phase of creating the seagull is to draw a simple bird with outstretched wings and clip it as a cel. Then, as you did with the tennis ball, you'll reposition the cel offscreen. On the optics panel, you'll first create the clocked path. When that is correct, you'll continue the movement so that the seagull flies off the screen on the other side.

You're welcome to add detail, such as an eye, to the seagull now or later. Because optical movements often distort and degrade the image, you're usually better off creating the optical effect in outline and going back later to fill it with colors, edge it, soften it, emboss it, or apply whatever other processing the image needs. It's easier to clean up an outline after rendering a move than to clean up an image that's already been softened, filled with a gradient ink, or otherwise processed.

---

### **Preparing the Cel of the Seagull**

*Type fry*

*Click cluster box*

*Select a bright magenta for the seagull.*



Use **DRAW**

*Sketch* outline of seagull in flight, as illustrated.

Fill outline or add other touches, as desired.

Type **sc**

Clips image to swap screen.

Press **<tab>**

Clips cel.

Type **x**

Clears screen.

Save cel as SEAGULL.CEL.

Type **M**

*Pick up* cel and move by clicking to its left and clicking to set new position offscreen to right, 321 25 on status line.

---

In its new position, the cel will start its movement from the upper right.

### ***Creating the Optical Effects for the Seagull***

You must create the seagull's swooping flight in two segments, because a path movement can't both start and end offscreen and a clock path movement will best create the illusion of soaring flight. In the first segment, you'll draw a path while the clock icon is running, taking the seagull from offscreen on the right to the left edge of the screen.

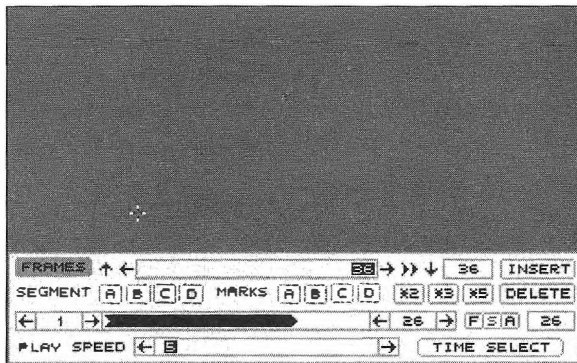
After selecting the clocked option for drawing a path, you'll click on the screen to begin the procedure. When you click again, an icon of a clock appears at the top of the screen and the clock's hand starts turning. While you hold down the mouse button, you can draw until the clock's hand reaches 12 o'clock. The time you have to complete the path — the speed of the clock's hand — depends on how many frames are in the sequence.

Animating an object on a clocked path results in an impression of more spontaneous movement than you can achieve with the other movements. It can be tricky at first. You may need to try several times before you get the timing and end point right.

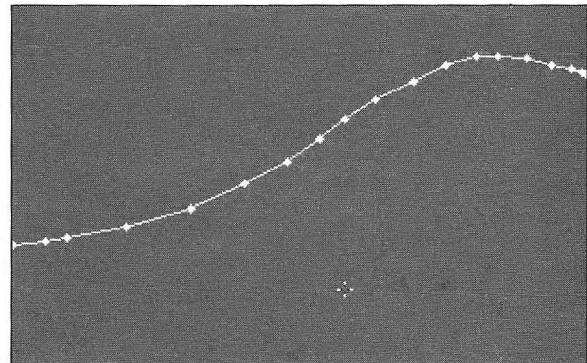
A path movement cannot both start and end offscreen on opposite sides. So in this instance, you'll take the seagull from offscreen on the

right up to the left edge of the screen in the first segment. Then you'll pick up the movement with CONTINUE MOVE for the second segment by selecting MOVE and specifying a distance on the X slider that will carry the bird off the left side of the screen.

**NOTE** *When MOVE is selected, the mouse control buttons can only move a cel the width or height of the screen. If you were to specify a move greater than 320 (the width of the screen) on the MOVE slider's X axis, the entire move would be made in one sequence, but without the impression of soaring. Other options, such as PATH, would also have carried the seagull offscreen for the short distance in the second segment.*



*First Segment Set for Seagull's Path*



*Clocking a Path for the Seagull*

Because you reset the program in the preceding exercise, you'll need to select the cel as the element on the optics panel again. To ensure that the center of the cel is correctly placed, you'll click on the default option for SPIN CENTER and check the slider settings before applying the movements. The cel is entirely offscreen, so you won't see anything if you try to check the center position with the wireframe icon.

---

## Making the Seagull Soar

Continue from previous exercise.

On frames panel, create 36 frames.

**Right drag segment slider bar**      Set a segment of frames 1 through 26 and

*Right drag segment slider bar* right click [A] segment button to assign it.  
*Click [A] segment button* Set a segment of frames 27 through 36 and right click [B] segment button.  
Sets first segment as current segment.

Return to home panel.

*Click mini-palette* Select white as current color, to make path visible.  
*Type opc* Displays optics panel and clears optics settings.

*Open ELEMENT Select CEL*

*Click CENTER Click DEFAULT* Sets default center; X slider (top) should show a setting close to 350 35, somewhat right and down from 319 25, the top left corner of offscreen cel.

*Click [S] button* Limits optics movement to selected segment.  
*Click PATH Click CLOCKED* Click screen, then click and hold on upper right edge of screen, holding down mouse button while quickly drawing a path that swoops to lower left edge of screen, as illustrated.

*Click WIREFRAME* If it doesn't make a smooth, full swoop, click CLEAR TRACK and redo the clocked path.

Preview on time select panel and if correct, render. If not, return to optics panel and redo.

*Right click frame control icon* On frames panel click [B] segment button.

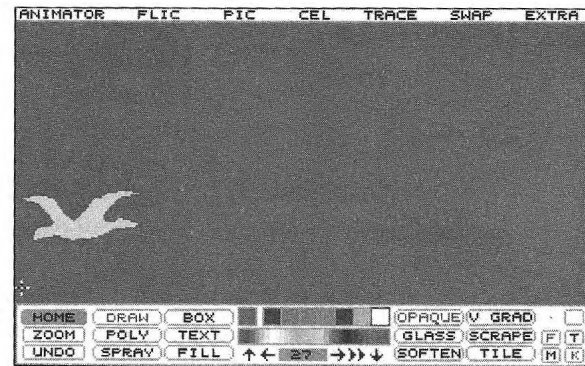
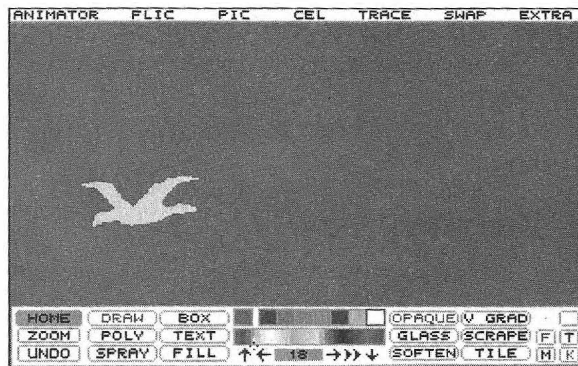
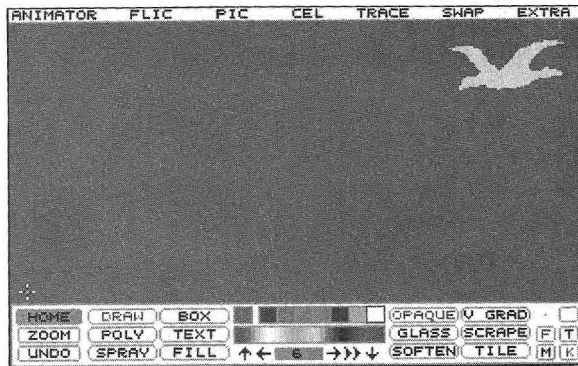
Right click screen until optics panel is displayed again.

*Click CONTINUE MOVE* Sets start position for next movement at end of preceding movement.  
*Click MOVE* Set X slider to -100 to move seagull horizontally to the left offscreen.

Check wireframe, preview, and if OK, render. If the seagull darts offscreen too quickly, try a lower setting on the X slider, such as -50. If it still moves too quickly, expand the number of frames in the second segment.

Play entire flic and save it as SEAGULL.FLI.

---



*Frames of Seagull Soaring*

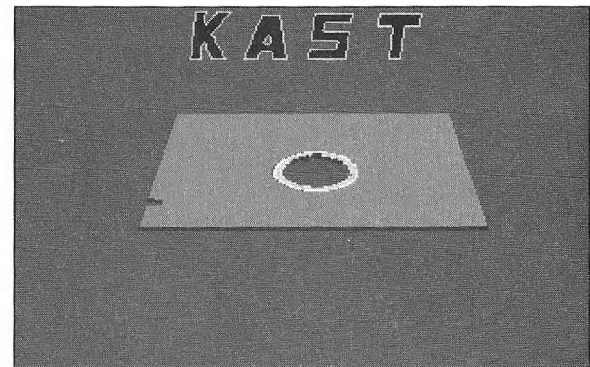
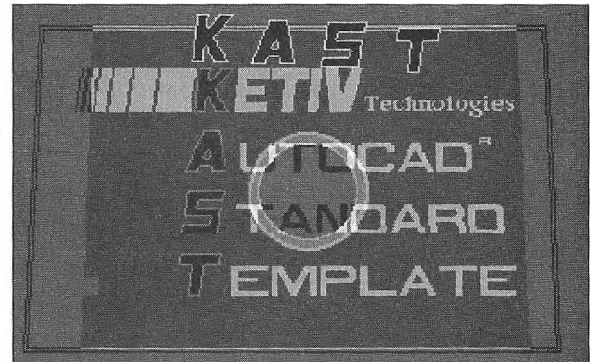
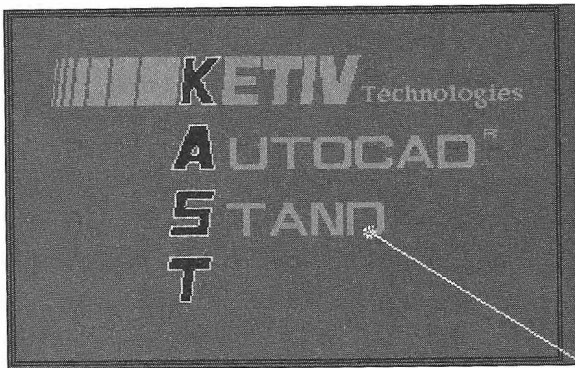
**NOTE** *Don't delete files at this point. You will need the files you created and saved in this chapter for the Club Baltic flic in Chapter 13.*

## Other Examples

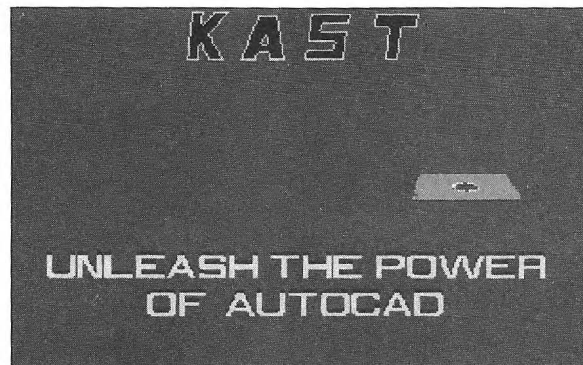
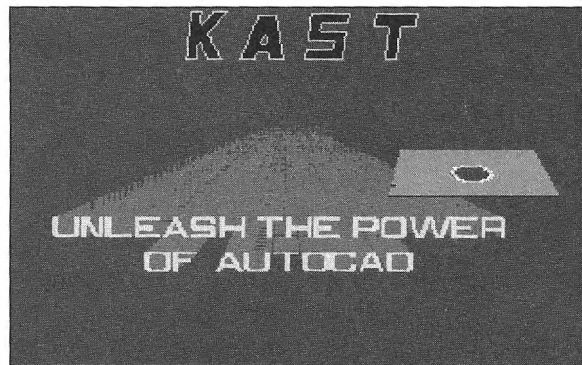
The illustration at the beginning of this chapter is an example of a striking picture resulting from an optical movement. In this instance, the original file, which consisted only of the Dodger poster, was created on the Aurora 100, a high-resolution, professional system. The image was scanned from a 35mm slide on a CIS•3515 scanner from BarneyScan Corporation, which produced a Targa16 file. The Targa file was converted to a GIF file with the Converter program and brought into Animator. In Animator, a flic was made, spinning the

poster back, and then one frame was chosen for further painting and image processing to suggest the baseball uniform as the background.

Another example of spinning movement is in the following series of frames from David Nilsen's animation introducing a new product at Ketiv Technologies, Inc. After the titles come on, the background turns into a floppy disk which spins and pulls back on a path, leaving room in the center of the screen for more text.

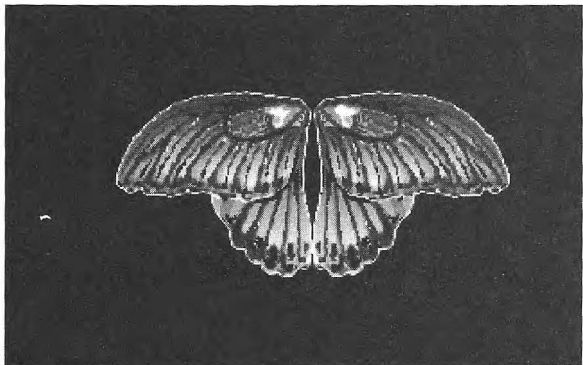
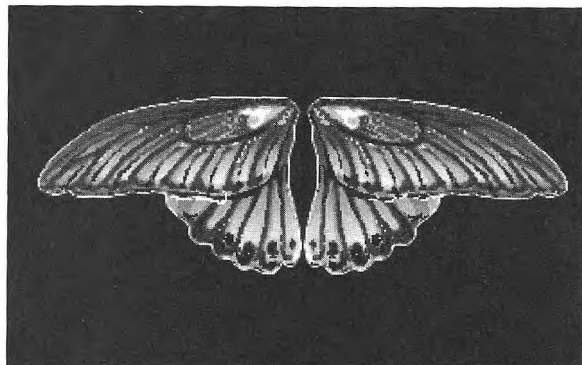


*Flying Flipping Floppy*

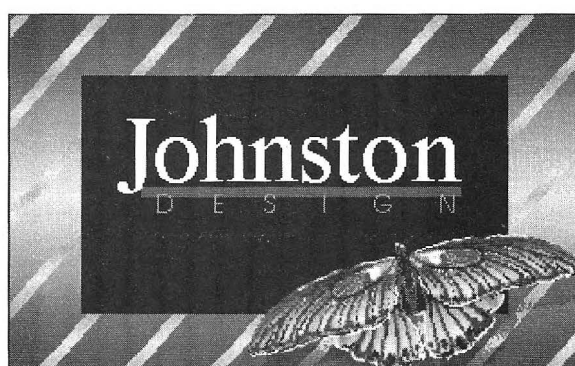
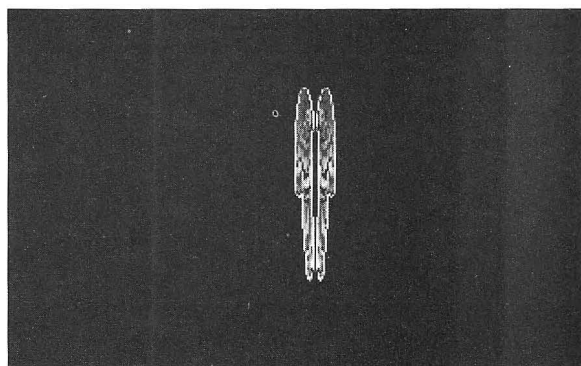
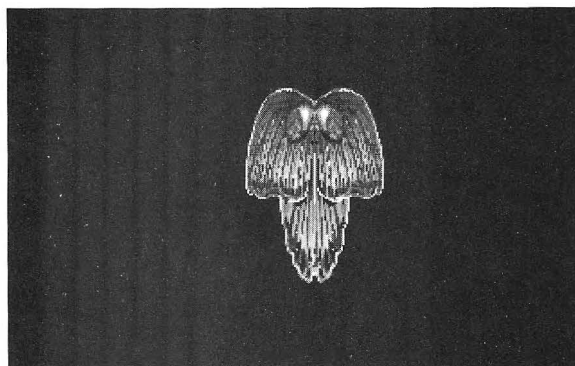
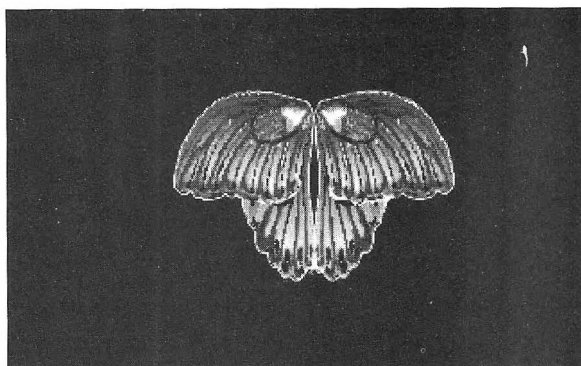


*Flying Flipping Floppy*

Jeri Johnston's butterfly in the next example, an ID for Johnston Design Associates, is animated on the optics panel as well. First, one wing was rotated up; then the flic was mirrored to reverse the movement for the second wing.



*Fluttering Butterfly*



*Fluttering Butterfly*

## Next Steps

In Chapter 13, you'll put the pieces together that you've prepared throughout Part 2. You'll composite the seagull with the guy and gal group exercising. The tennis ball sequence will be joined to the tennis title. You'll also see how to create the write on of the Club Baltic name as an extension of the line left from the spinning flic.



FP INP3BROZ





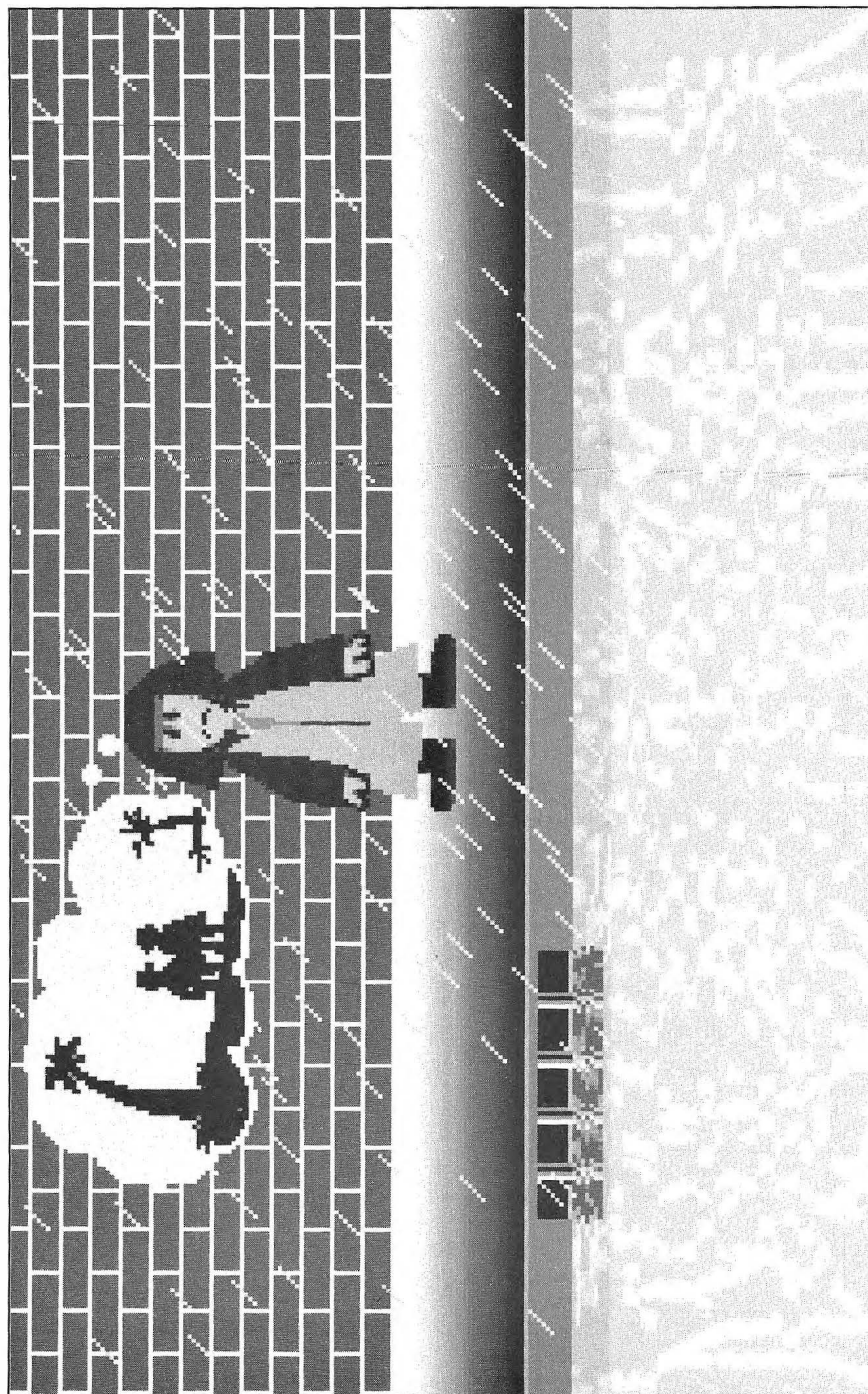
## **Completing Animations**

The two chapters in Part 3 show you how to put together and send off your animations to clients, critics, admirers, your mother — to anyone who has a VGA display.

- Chapter 13 illustrates transitional effects and complex effects you can achieve by compositing elements.
- Chapter 14 explains how to use the Player program to present animations without Animator, and how to bring AutoCAD and AutoShade files into Animator after converting them to flics in the Flimaker program.

When you put the Club Baltic animation together in Chapter 13, you'll see how to composite the seagull so that it flies over and past the characters doing their exercises, how to join and dissolve the rainy city pavement to ocean waves, and other powerful results of compositing and joining sequences you prepared in Part 2.

Chapter 14 teaches you to operate the Player program interactively and to write a Player script file that doesn't require your presence to run an animation. If you are experienced in using AutoCAD and AutoShade, you'll learn how to prepare images in these programs and bring them into Animator to create 3D presentations.



*Those Rainy Day Blahs*

# Joining and Compositing

In Animator, the whole is truly greater than the sum of its parts. Once the backgrounds and moving elements of an animation have been created, two powerful techniques for putting the parts together can come into play, with results worthy of much more expensive professional systems. Flics can be *joined*, or linked, into one continuous animation. Separate flics can be *composited* — layered on top of or beneath one another — for an abundance of effects.

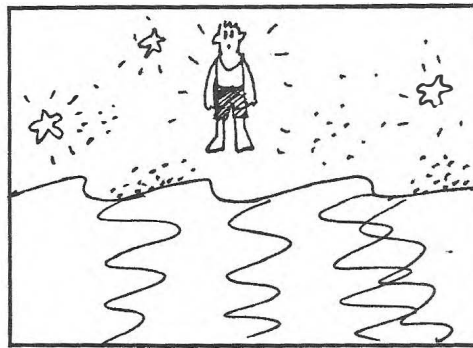
Flics can either be joined seamlessly or with visually intriguing transitions. For example, the pixels that form the final image of one flic can *dissolve* into the opening frame of a second flic. Or the opening of the second flic can *wipe on*, gradually replacing the last frame of the first flic. So, too, one flic can be layered over or below another flic, or two flics can seem to occupy the same space momentarily, while one *fades out* and the other *fades in*. Beyond the powerful automatic transitions the program offers, you can create your own, adding holds and designing unusual patterns for wipes or special tints for fades.

More than anything else, these sophisticated capabilities let you create animations of complexity and subtlety not possible in linear programs that limit you to one layer. In this chapter you'll see how to join and composite flics for the three main parts of the Club Baltic animation. The opening starts off with the romantic couple on the beach at sunset. This scene is abruptly revealed to be the fantasy of a lonely guy standing in the rain of a charmless urban street. As the bridge to the next scene, the lonely guy is magically transported to the Club Baltic beach, where all dreams are fulfilled — albeit sometimes only after a lot of exercise. This lengthy scene consists of the aerobics on the beach and the various moving elements that come along — the seagull, the tennis ball and its title, the fish skeleton and its title. The final sequences begin with the guy and gal on the beach at twilight, no longer a fantasy. This last scene flips over to become the Club Baltic logo, with the starfish mimicking the exercise routine.

This is an exciting chapter because preparations you've made in earlier exercises start to come alive. However, there's quite a bit included here and it's not necessary to do all the exercises at one sitting. You may even choose not to put together all the sequences, or to try them in simplified fashion. The IN DISK contains most of the flics for this chapter's exercises. Where an exercise is primarily a variation on a technique you've already acquired, you'll be advised that it is optional. If you wish to complete the animation, you should take stock of your system's memory and storage capacity. The full-dress animation creates large files, especially if you enhance the bare outlines of figures and backgrounds. To minimize this, you'll be told which preliminary files you can delete.

## Planning Ahead to Composite and Join Flics

From the beginning of this book, you've been advised to start with a storyboard that details as much of the final design as possible. The Club Baltic storyboard, which has been the guide for this animation from the outset, shows where compositing and joining will create particular effects. For example, the fantasy balloon will be composited over the lonely guy in the rain, who will dissolve into the guy on the beach. And a combination of joining and compositing will expand the nine frames of the basic exercise cycle and bring on each character over the beach background.



*Dissolve From Rainy City to Beach*

More than one person can work on a project if it is planned so that smaller flics are first prepared and then joined and composited. A well-defined storyboard and layout gives each person a firm idea of how the parts will ultimately go together.

### ***Planning Ahead for Play Speed***

When planning the play speed of individual flics, you should consider how long it takes for an image to be absorbed by the viewer, how long text should remain on screen for the viewer to read it, and how long a transition ought to last. A rule of thumb is to introduce new elements singly and give each one time to be acknowledged before introducing another one. In broadcast productions, text is typically left on screen for three seconds. However, the size, legibility of type, and amount of text all affect the length of time onscreen. You can use a stopwatch to time sequences, noting the timing that seems best for different kinds of movements.

Play speed varies according to the hardware on which an animation is played. In designing flics that are to be played back on equipment other than that used to create them, you can't adjust the timing for universally optimal effects. However, the Player program explained in Chapter 14 offers some room for adjustment on different equipment.

**TIP** *If your animations will be played on other systems, you can include a ten second, ten frame countdown flic. The countdown can be timed on other systems to see how to adjust the timing throughout your animation, and you can use the Player program to make such an adjustment. To achieve a standardized play speed, you can transfer animations to videotape, and the speed will be 30 frames per second. See the appendixes for more information.*

Sequences that are destined to be joined and composited into a single flic need to be designed so that all the movements work at the same speed. There is no way to vary the play speed within a flic. Although you can adjust the timing of individual sequences — inserting pauses and duplicating inbetween positions — these adjustments are not always feasible for coordinating sequences that are composited together. For example, the exercise cycle works well with nine distinct frames; but the figures would lose their spirited energy if the frames were doubled or tripled to slow it down. Consequently, all the moving elements in the main section of the Club Baltic animation have been designed for the same speed as the exercise cycle, a setting of 10 on the play speed bar.

### ***Combining Palettes***

Try to design the palettes of flics you will be joining and compositing so that you, not Animator, decide which colors are used. Where possible, design one palette that works for all the frames of the final flic.

**NOTE** *As you know, each frame of a flic can have its own palette of 256 colors. However, you may notice odd effects of flashing or “snow” between the frames when the palettes change, especially if each palette uses many colors.*

When you composite flics with different palettes, you choose whether to use one flic’s palette exclusively or to have Animator combine palettes. The WHAT ABOUT THE COLOR MAPS? submenu offers four options for keeping the colors within the 256 color limit:

- COMBINE COLOR MAPS takes all the colors in the palettes of both flics, and if more than 256, squeezes them, fitting colors used in the flic to the 256 colors in the combined palette.
- KEEP CURRENT COLOR uses the first flic’s palette, fitting any of the second flic’s colors that aren’t in it to this palette.
- USE OVERLAY COLOR takes the second flic’s palette and fits any of the first flic’s colors not in it to this palette.
- NO FITTING uses the first flic’s palette and converts any of the second flic’s colors not in it to the RGB value in the same color register slot.

These automatic operations to combine palettes are impressive and convenient. However, if the number of colors exceeds 256, Animator squeezes the palette and may not keep certain colors that you would. A logo that absolutely must have grayish-green letters, for example, might end up a greenish-gray color.

**NOTE** *When compositing, Animator will display the WHAT ABOUT THE COLOR MAPS? submenu whenever it encounters a frame whose color map matrix differs from the previous frame. When you see this while doing the exercises, select KEEP CURRENT COLORS. You may see this where shown in the exercises, it may not appear at all, it may appear at a different point, or it may appear more than once.*

**TIP** *To maintain greatest control over your palettes when you are compositing two flics, first change them all to one master palette by joining the flics and selecting ONE PALETTE on the PALETTE menu of the palette panel. Then use the RGB and HLS sliders to check and adjust the results manually if squeezing eliminated any crucial colors.*

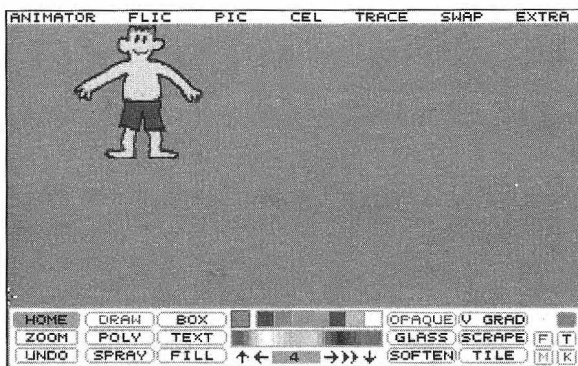
## Compositing the Exercise Cycle on the Beach Background

To start assembling the Club Baltic animation, you'll put the basic exercise cycle together with the background scene of the beach. First, you'll shrink the flic of the guy exercising so that he'll be the same size as in the pictures of him with the gal in Chapter 8, COUPLEF.GIF. Then, you'll create a flic of the beach as a static background onto which you can composite the flic of the guy in his reduced state.

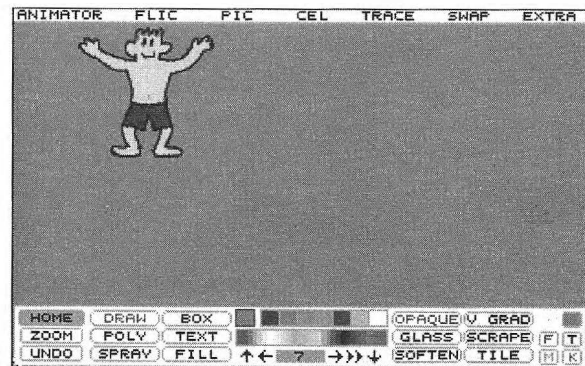
You can use the flic you created in Chapter 8, GUY05.FLI, or you can use IN08GUY5.FLI from the IN DISK. For the beach background, you can use BEACH.GIF from Chapter 8, or IN08BECH.GIF from the IN DISK.

### Shrinking the Exercise Flic

The procedure for shrinking an entire flic is the same as for shrinking one frame (which you did in Chapter 8), except that you turn on the [T] button. Each frame of the entire flic is reduced to one-quarter its original size. The resulting flic will be saved as GUYX2.FLI.



Frame 4 Shrank



Frame 7 Shrank

---

## Shrinking the Exercise Flic



Load IN08GUY5.FLI.



Load GUY05.FLI.

Set key color to gray background color and turn on [T] button.

Open <b>FLIC Select EFFECTS</b>	Displays SPECIAL EFFECTS submenu.
Select <b>SHRINK X2</b>	Displays time select panel because [T] button is on.
Click <b>RENDER</b>	Each frame of flic is reduced to one-quarter of original size.

After rendering, position the cursor close to the guy and press <F1> to see if SHRINK X2 changed the surrounding background to a different gray than the key color. If <F1> doesn't highlight the key color slot, select SEPARATE from the PIC menu and click near the guy, then render to fill the surrounding background on all frames with the key color.

Save this flic as GUYX2.FLI.

---

## *Compositing the Exercise Cycle Onto the Beach Background*

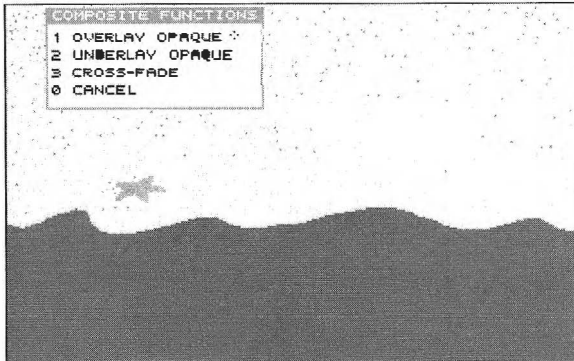
Now you'll clear out GUYX2.FLI by selecting FLIC NEW, leaving the gray in the key color slot for the transparent background during compositing. You'll load the background scene you drew in Chapter 8 (BEACH.GIF) and make a flic of nine frames — the same length as the exercise cycle. Then you'll select COMPOSITE on the FLIC menu, and select GUYX2.FLI.

When you composite two flics, you have three choices about how the frames of one flic will be combined with the frames of the other. The first option, OVERLAY, superimposes the flic you select on top of the current flic. The second option, UNDERLAY, layers the flic you select under the current flic. The third choice, CROSS-FADE, does not layer either flic but instead increasingly darkens the frames of the current flic while the frames of the second one are lightened, so that the second flic seems to replace the first.

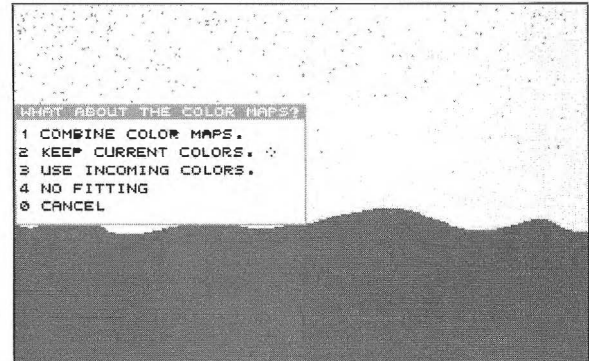
When the COMPOSITE FUNCTIONS submenu appears, select OVERLAY. The beach will show through the gray background key color of GUY05.FLI except where the guy's figure is overlaid. As the



color mapping option, select **KEEP CURRENT COLORS**. Both flics use only colors from the default palette, so all the original colors will be available without squeezing or fitting.

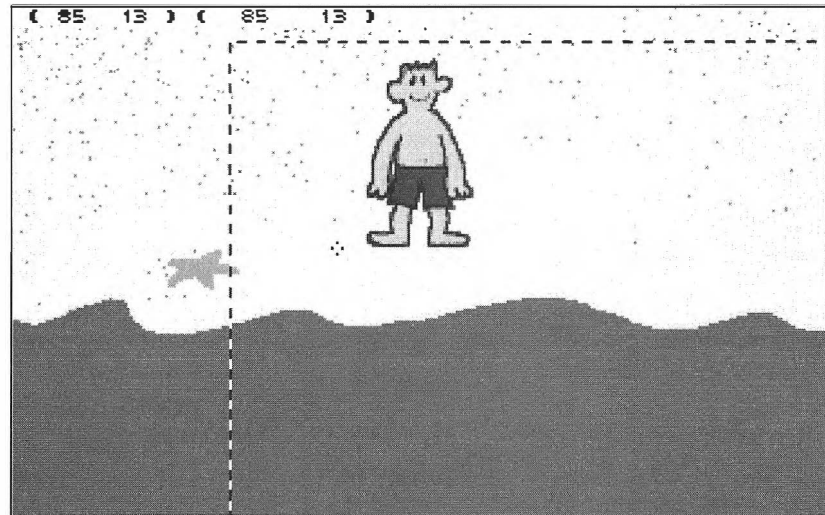


*Choosing COMPOSITE OVERLAY*



*Choosing KEEP CURRENT COLORS*

Before compositing begins, the first frame of GUYX2.FLI appears on top of the beach background. You can click to pick up the entire frame and move it, as you do when moving a cel. Position the guy in the middle of the screen, as illustrated.



*Positioning the Frame Before Compositing*

## Compositing the Exercise Cycle

Continue from previous exercise.

Type **fny**

Clears out flic, leaving gray in key color slot and [T] button on.



Load **IN08BECH.GIF**.



Load **BEACH.GIF**.

On frames panel, create nine frames and return to home panel.

Open **FLIC** Select **COMPOSITE**

Select **OVERLAY**

Displays overlay, underlay, and cross-fade choices.

Select **GUYX2.FLI** as flic to be composited over current flic.

Select **KEEP CURRENT COLORS**

Click screen Move cursor

Position guy in center of beach, as illustrated.

Click screen Click **YES**

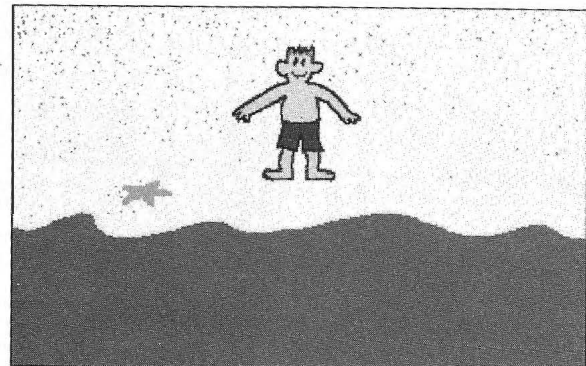
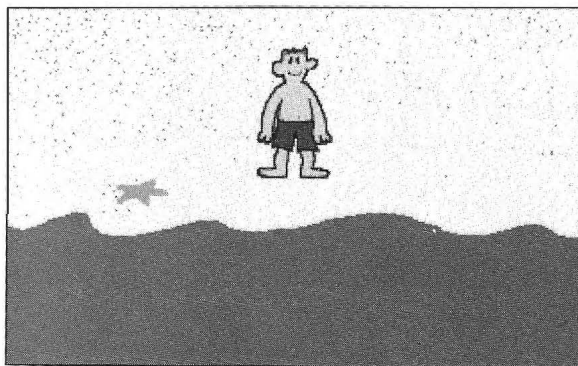
Sets position and starts compositing at current frame.

Play flic and save as **BEACHGUY.FLI**.

---

You now have one complete cycle of the guy exercising on the beach.

Being able to reposition the flic before overlaying or underlaying it is a powerful asset. Although you should plan the position of elements at the storyboard and layout stages, this final adjustment often saves you from having to rework a flic.



*Guy Composited on Beach Background*

## Expanding the Exercise Cycle With JOIN

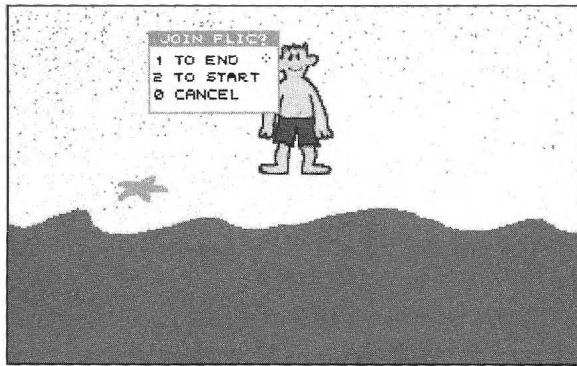
According to the storyboard, the exercise cycle is repeated for much of the Club Baltic animation. The seagull, tennis ball, fish and skeleton, and title sequences come on the scene and go off again while the guy steadfastly exercises.

In this section, you'll expand the cycle to create enough frames for compositing the other moving elements of the animation. You'll double the flic by joining a duplicate set of frames to its final frame. Then, you'll redouble it until you have enough frames to create an uninterrupted continuously repeating cycle.

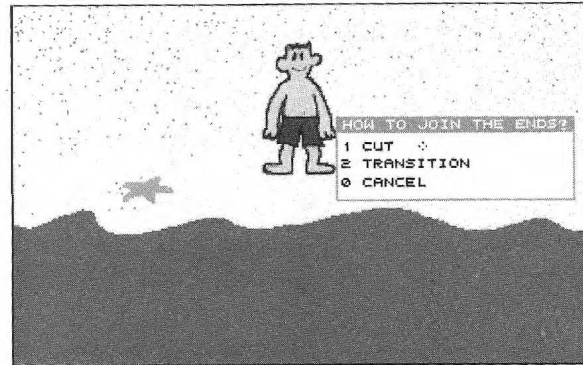
When you join two flics, you can insert a sequence of transitional frames, or make a straight *cut*. A cut joins the last frame of the first flic to the first frame of the second flic, or vice versa. In later exercises, you'll use Animator's automatic transitions for special effects in joining flics. But in this instance, you'll make a clean cut.

With BEACHGUY.FLI loaded, you'll select JOIN on the FLICS menu and select BEACHGUY.FLI again, as the flic to be joined to its end. When asked how to join the ends, you'll select CUT for no transition. After the flics are joined, you'll save the expanded flic of 18 frames as BEACH01.FLI. Then you'll join this flic to itself to double it, making it 36 frames, or four complete cycles. You'll double twice more until the flic is 144 frames long, saving each expanded version with the same name to conserve disk space.

**TIP** *You'll repeat the steps to join and save a flic to itself with the same name twelve times in the next three exercises. You can use these keyboard alternatives: FJ1 <enter> 1FFS <enter> Y <spacebar>. Better still, record the keystrokes and play them as a macro.*



*Joining to End*



*Joining With Cut*

---

## Expanding the Cycle

Continue from previous exercise or load BEACHGUY.FLI.

*Open FLIC Select JOIN*

*Select TO END*

Sets flic to be joined at end of flic currently in memory and displays file selector for choosing flic to be joined.

BEACHGUY.FLI should be the default filename, so just click on OK, and the submenu for choosing whether to make transition or not is displayed.

*Select CUT*

Joins flics with no transitional frames.

Check that frames icon shows 18 frames (two cycles) and save as BEACH01.FLI.

*Open FLIC Select JOIN*

Repeat the joining (making and using a macro, if you wish).

Select TO END, select BEACH01.FLI as flic to be joined, and select CUT.

Check that frames icon shows 36 frames (four cycles) and save as BEACH01.FLI.

Repeat the joining and saving twice more to end up with 16 cycles of 144 frames and save the final version as BEACH01.FLI.

---

The expanded cycle will now serve as the foundation for the remaining moving elements to be added.

## Compositing the Other Exercisers With Underlay

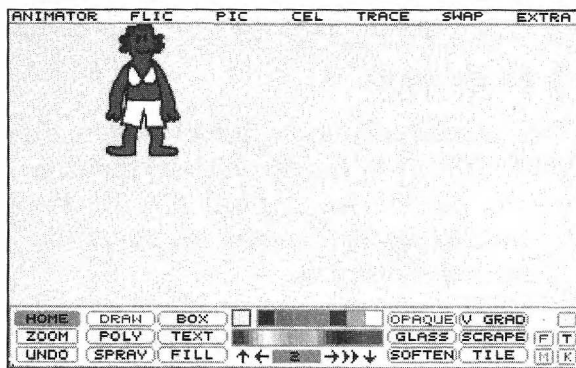
In this section, you'll see how to composite more fitness aficionados onto the beach scene, using UNDERLAY to give the illusion that they are farther back on the beach, behind the original guy. So that additional characters don't slavishly imitate the original guy, they'll begin exercising on different frames of his cycle.

You'll position the characters behind (a bit higher up on screen) and to the right or left of the original guy. Because the gal, and any other characters you add, will be composited under the beach scene, any overlapping legs or arms appear to be behind the guy.

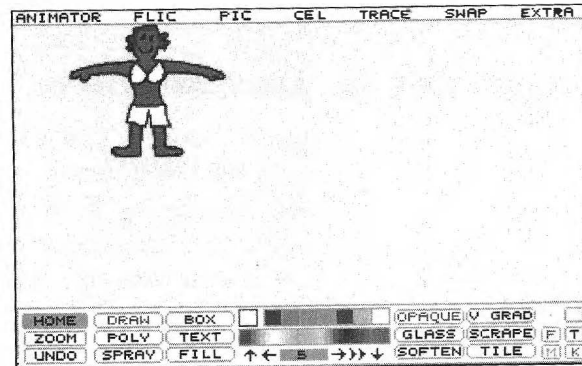
### *Compositing the Gal*

You already created one variation of the character cycle in Chapter 8, GAL.FLI. The following exercise shrinks this flic and composites it as an underlay beneath BEACH01.FLI. First, you'll change the key color to the color of the sand on the beach. Then, after loading GAL.FLI, you'll change the background color on all nine frames of that flic to match the sand key color; otherwise, the beach would turn gray when you composite it. With the background changed to the key color, only the image of the gal will show through the sand color, so she'll appear to be on top of the sand.

**NOTE** *If the sand has starfish, speckles, or other textural enhancements in the area you underlay a character, the composited character will exhibit these markings. To avoid discovering this when your only recourse is to remove speckles by hand from many frames, plan at the layout stage to keep any areas where underlays will be composited clear of all but the key color.*



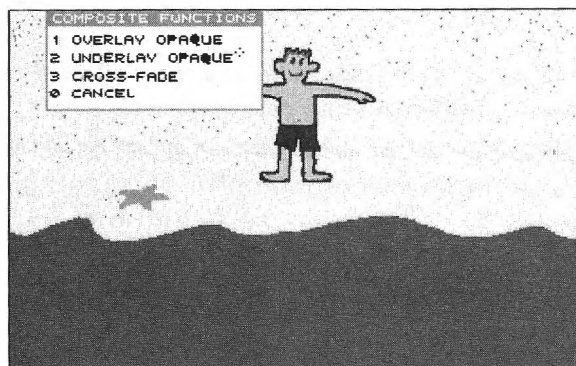
Frame 2 of GAL.FLI Shrunk



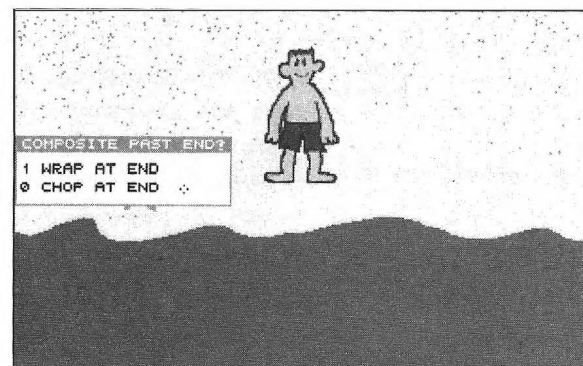
Frame 5 of GAL.FLI Shrunk

Next, you'll shrink the flic and join it to itself until it is 144 frames, more than long enough for compositing onto BEACH01.FLI. The alternative, repeatedly compositing the cycle of nine frames onto BEACH01.FLI, is more tedious and error-prone.

The guy should exercise by himself long enough for the viewer to take in his actions, so you'll let him go through two cycles before the gal appears. To inject some variety, you'll start compositing her cycle on frame 20, which is in the middle of one of his cycles. Thus so her motions will not quite synchronize with his.



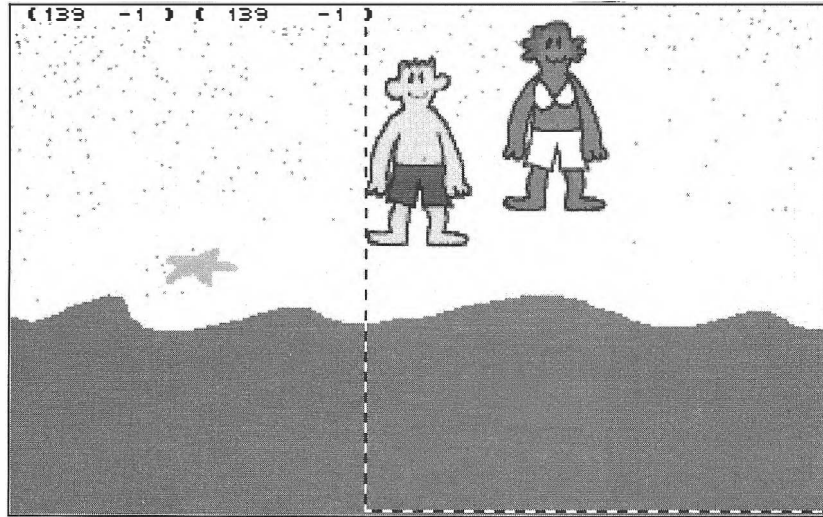
Choosing Composite Underlay



Chopping Off Frames at End

When a flic you are compositing has frames left after the last frame of the current flic, you can either cut off the extra frames or wrap them around and continue compositing from frame 1 of the current flic. In

this case, the flics to be composited are both 144 frames. Because you're starting the gal on frame 20, you'll chop off the extra frames of the gal's cycle at the end.



*Positioning Gal on Beach*

Now, you'll shrink GAL.FLI and expand her cycle until it is 144 frames, saving the expanded flic as GALX2.FLI. Then you'll composite GALX2.FLI under BEACH01.FLI, so that the gal appears through the sand key color. The compositing may take 20 minutes on slower systems — time to do a few stretching exercises of your own.

## Adding the Gal to the Scene

Continue from previous exercise, or load BEACH01.FLI.  
Make sure [T] button is on.

Type <b>sc</b>	Copies beach to swap screen, in case you need sand color again.	
Right click <b>key color</b>	Click <b>screen</b>	Pick up color of sand as key color.
Click <b>key color</b>		Selects key color as current color.

Load GAL.FLI.

Open **PIC** Select **SEPARATE** Click on gray background to change it to sand color.

On time select panel, render the new background color.

Open **FLIC Select EFFECTS**

Select **SHRINK X2**

*Render flic shrunk to one-quarter original size.*

Save flic as **GALX2.FLI**.

If you made a macro earlier, use it to join **GALX2.FLI** to itself in the following steps.

Open **FLIC Select JOIN**

*Join **GALX2.FLI** to itself, making 18 frames (two cycles).*

Save again under same name.

Repeat joining and saving until **GALX2.FLI** is 16 cycles of 144 frames and save it again.

Load **BEACH01.FLI**.

Display frames panel, jump to frame 20, and return to home panel.

Open **FLIC Select COMPOSITE**

Select **UNDERLAY**

*Select **GALX2.FLI** to composite beneath **BEACH01.FLI**.*

Select **KEEP CURRENT COLORS**

Frame 1 of **GALX2.FLI** is displayed over frame 20 of **BEACH01.FLI** for placement.

Click **screen Move cursor**

*Position gal up and to right of guy, as illustrated.*

Click **screen Click YES**

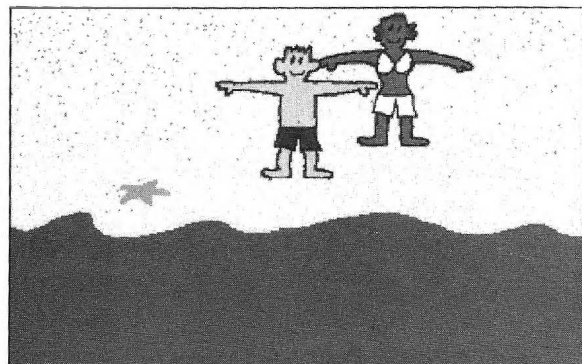
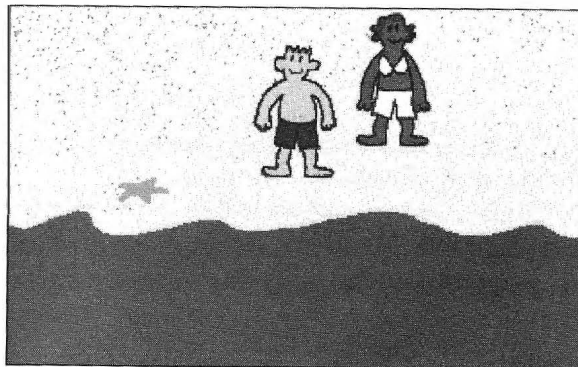
*Sets position and compositing begins.*

Select **CHOP AT END**

*Deletes frames of **GALX2.FLI** beyond last frame of **BEACH01.FLI**.*

Play flic and save as **BEACH01.FLI**.

---



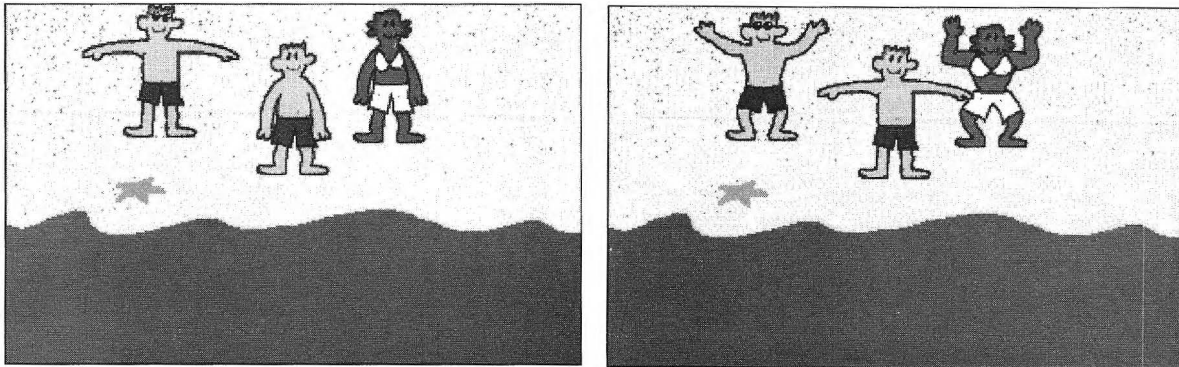
*Gal Added to Beach Scene*



Notice that the gal's cycle is not completed at frame 144, but the guy's cycle is. Having popped on at frame 20, the gal starts the first of her nine positions when the guy is on his second position. So when he's at the ninth position, she's on her eighth position. This staggered effect complicates any joining or dividing you might want to do with the full exercise sequence. To keep characters coordinated, always join or divide at the end of the first guy's cycle. For example, you could join just the last nine frames of BEACH01.FLI to itself, because they contain a complete cycle of the first guy's positions. Then all the other characters will cycle completely, even though they won't all finish at the end of the sequence. Or you could divide the flic into two between frames 72 and 73, making eight complete cycles of nine frames of the guy.

### ***Compositing Another Guy***

Now, if you like, you can add a cool dude exercising on the left side of the beach. Although the illustrations include him, he is optional. To put him in the scene, you would quickly alter the color of the guy's bathing suit in GUYX2.FLI and add sunglasses. Then you would change the background to the color of the sand, as you just did in GALX2.FLI, expand the cycle to 144 frames, and composite the cool dude as an underlay onto the BEACH01.FLI. For best effect, you would start his cycle on a frame later in the flic, perhaps at frame 39, and chop off the extra frames at the end.



*Cool Dude Added to Beach Scene*

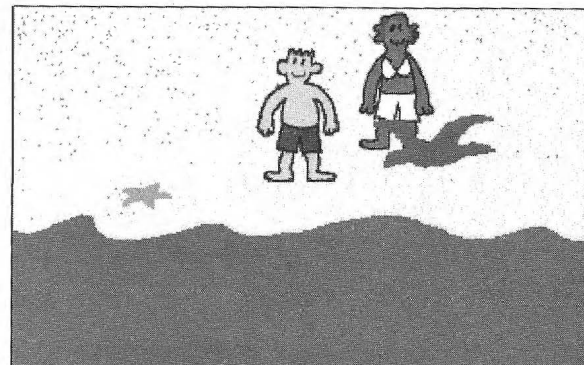
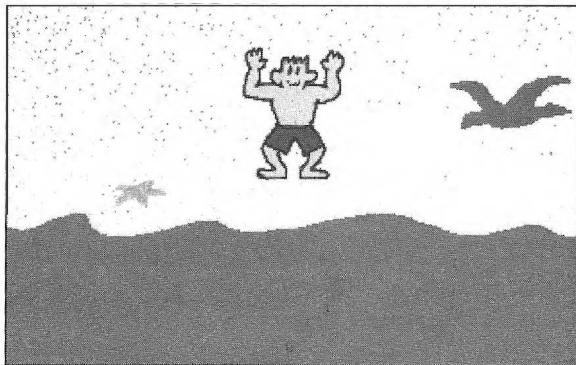
**MORE** *If you would like to composite other characters onto the beach scene, you can change the colors or patterns of the bathing suits in GUYX2.FLI and GALX2.FLI. Then expand each new character cycle to the length needed and repeat the composite underlay procedure shown in this section. Have new characters pop on at different frames.*

## Compositing the Seagull

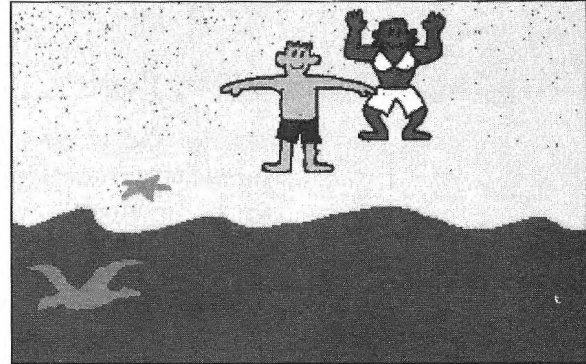
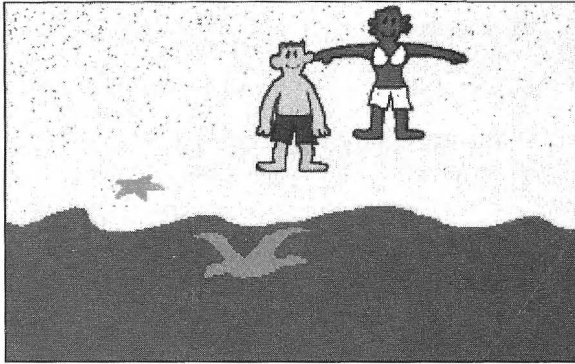
You'll start the compositing on frame 10 so that the seagull flies in just before the gal pops on. Remember that the seagull is offscreen on the right at the start of its path; when the first frame appears for positioning, you won't see the seagull. According to the storyboard, the seagull flies in from the right just before the gal pops on and exits on the left before the rest of the characters appear. The seagull's flight will appear to be slower than the athletic movements of the guy and gal, demonstrating the effectiveness of adding elements that move slower or faster than the rest.

The SEAGULL.FLI file you created in Chapter 12 is the basic animation of the bird on its optical path. The bird is a simple figure outlined on a black background (the default color in register zero of the color matrix). Because the seagull flies over the various colors of the sand, water, and gal, it cannot be composited as an underlay. It must be composited as an overlay with its background in the key color.

If you didn't fill in the seagull's body with an opaque ink in Chapter 12, you'll see parts of the background through the bird. A more finished version, IN12GULL.FLI, is on the IN DISK.



*Seagull Composited on Beach Background*



*Seagull Composited on Beach Background*

## Compositing the Seagull

Continue from previous exercise, or load BEACH01.FLI as saved in previous exercise.

*Right click* **current color**  
*Right click* **key color slot**  
*Click* **color matrix slot zero**

Displays palette panel.  
 Sets key color to be changed.  
 Makes register zero the key color.

Return to home panel.

Display frame 10 of BEACH01.FLI.

*Open* **FLIC** *Select* **COMPOSITE**

*Select* **OVERLAY**



Select SEAGULL.FLI or IN12GULL.FLI, if you prefer.



Select SEAGULL.FLI.

*Select* **KEEP CURRENT COLORS**

Right click to accept positioning even though you can't see seagull, and click YES to start.

Make sure play speed is 10, play to view the combined movements, and save the flic again as BEACH01.FLI.

The seagull flic is only 36 frames long, so it starts on frame 10 and is gone by frame 46.

## **Dividing a Flic Into Two Parts**

Joining and compositing flics can quickly create very large files. Animator allows up to 4,000 frames in one flic. However, large files can be unwieldy, especially if you are transferring them to floppy disks for sending out to clients or editing them for videotape. A solution is to create several smaller files and link them in playback with Animator's Player utility program, as described in Chapter 14.

BEACH01.FLI is now probably over 500K and there's more to come. Even at this size on a fast machine, the file already takes a noticeable amount of time to load and save.

The first 72 frames are now complete, building up to at least three exercisers on the beach, with the seagull flying on and off. Now is a good time to divide the flic into two equal flics, each 72 frames long. You can use the second flic of 72 frames as the background for the remaining moving elements you'll composite. The tennis ball and its title can be composited over this background as one flic and the fish skeleton and its title can be composited as another flic. Each flic will begin with the first position of the original guy's cycle and end with the last position, because 72 is exactly eight cycles of the original nine frames.

To divide the flic in half, you'll delete the first 72 frames and name the resulting flic BEACH02.FLI. Then you'll reload BEACH01.FLI, delete the second 72 frames and save it again as BEACH01.FLI.

---

## **Dividing the Flic in Half**

Continue from previous exercise or load BEACH01.FLI.

Display frames panel.

**Click up arrow**

Displays frame 1.

**Right click DELETE**

Delete 72 frames, leaving last 72.

Save flic as BEACH02.FLI.

Load BEACH01.FLI again and display frames panel again.

Right click frames bar	Jump to frame 73.
Right click DELETE	Delete 72 frames, leaving first 72.
Save flic as BEACH01.FLI	

---

If you want to reconnect BEACH01.FLI with the various flics you'll make from BEACH02.FLI, you can do so with JOIN and CUT and the exercisers won't miss a beat. Chapter 14 will show you how to write a script for the Player program that links them with no delay between them.

**TIP** *Divide flics at an easily recognizable point to avoid confusion about which file follows which. You can indicate appropriate divisions in the storyboard. Creating many small files demands a careful naming system to keep track of the order.*

## Joining the Rainy City and the Beach With a Transition

In this section, you'll put together the part of the animation in which the lonely guy is transported from the rain to the beach, where he waits, hopeful something wonderful is about to happen to him at Club Baltic. To make this transition, you'll use a *dissolve* to join a flic of the lonely guy in the rain to a flic of the guy waiting on the beach. In a dissolve, the last image of the first flic seems to disintegrate and reform itself into the first image of the second flic.

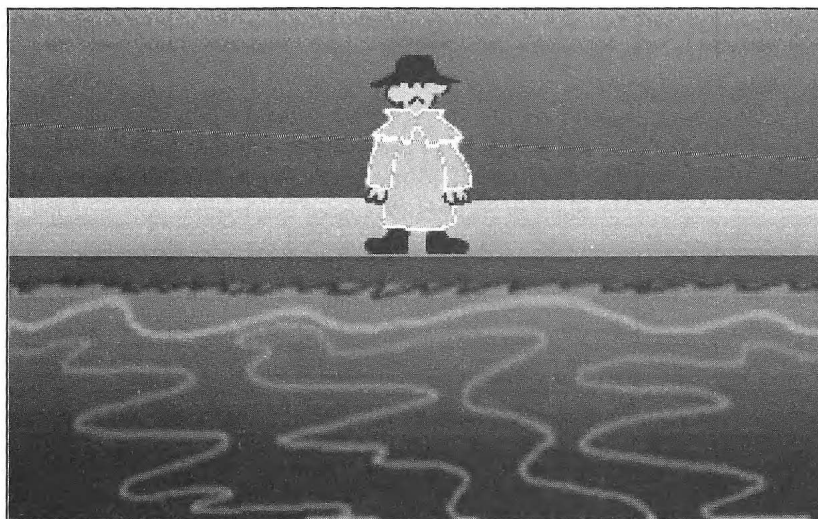
### *The Lonely Guy in the Rain*

To create the flic of the lonely guy in the rain, you'll take the first frame of BEACH01.FLI, which shows the guy standing on the beach before going into the exercise routine. Change the guy's clothes so that he's wearing a raincoat, galoshes, and hat. Give him a woebegone facial expression more appropriate to his soggy state. To make a new background, paint over the brightly colored beach and ocean, so that the scene is gray and gloomy. Then you'll create a flic of 24 frames, GUYRAIN.FLI, duplicating this image.

The illustration shows the guy in a rain slicker and hat. You can make the scene simple or more elaborate — just be sure you make it gray. Changing the guy's mouth quickly establishes the mood. A few horizontal lines suggest a curb in front of him and walls behind him, filled in with gradient inks using different arrangements of the

gray-scale cluster. The street of rainy puddles consists of lighter wavy lines over a medium gray. Keeping color to a minimum — perhaps just yellow for the slicker — increases the dramatic contrast when the scene shifts.

Altering the figure from BEACH01.FLI for GUYRAIN.FLI guarantees that the two figures are *registered*. That is, the guy on the beach will be in exactly the same position as he is in the rain.



*Lonely Guy in the Rain*

---

## Lonely Guy in the Rain

Continue from previous exercise, or load BEACH01.FLI and make sure the [T] button is off.

Display frame 1 of BEACH01.FLI.

<b>Type sc</b>	Clips to swap screen.
<b>Type fny</b>	Clears out flic.
<b>Type sp</b>	Pastes swap screen.

Change figure and background as illustrated, adding your own embellishments if you like.

On frames panel create a flic of 24 frames.

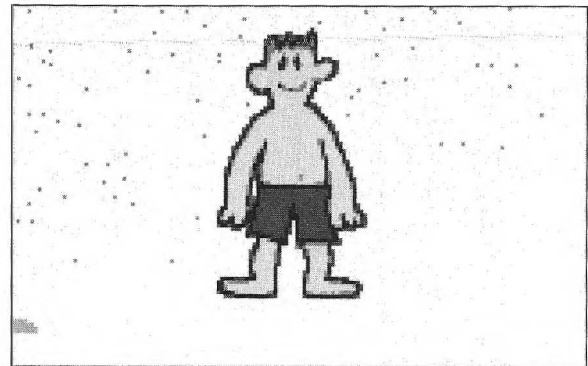
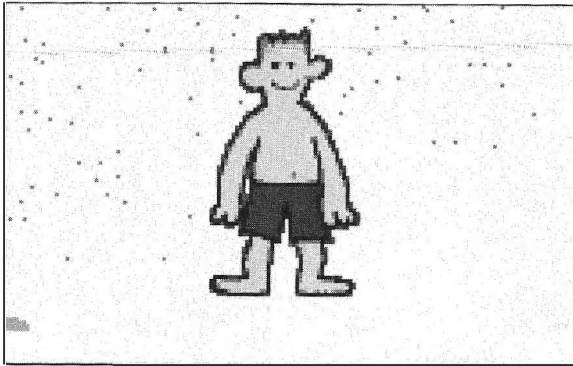
Save flic as GUYRAIN.FLI.

---

Now you have the first flic you'll join to the flic of the guy waiting on the beach.

### ***The Guy Waiting on the Beach***

You'll use the first frame from BEACH01.FLI again to create a flic of 24 frames you can join to GUYRAIN. So that these frames are not completely static, make the guy blink while he waits for the action to begin. To draw the blink, just zoom in on the guy's head and cover part of each eye with flesh-colored pixels for a few frames. You'll save this flic as GUYBLINK.FLI.



*Guy Blinking*

---

### **Making the Guy Blink**

Continue from previous exercise, or load BEACH01.FLI and clip the first frame to the swap screen.

**Type fny**

Clears flic.

**Type sp**

Pastes image from swap screen.

On frames panel, create 20 frames of the image, jump to frame 12, and return to home panel.

**Move cursor Press <f1>**

Pick up guy's flesh color as current color.

**Click ZOOM Click screen**

Move cursor so zoom box includes guy's head and click to set the zoom box.

**Use DRAW**

Cover over top few pixels of each eye, using opaque ink.

**Click ZOOM**

Turns off ZOOM.

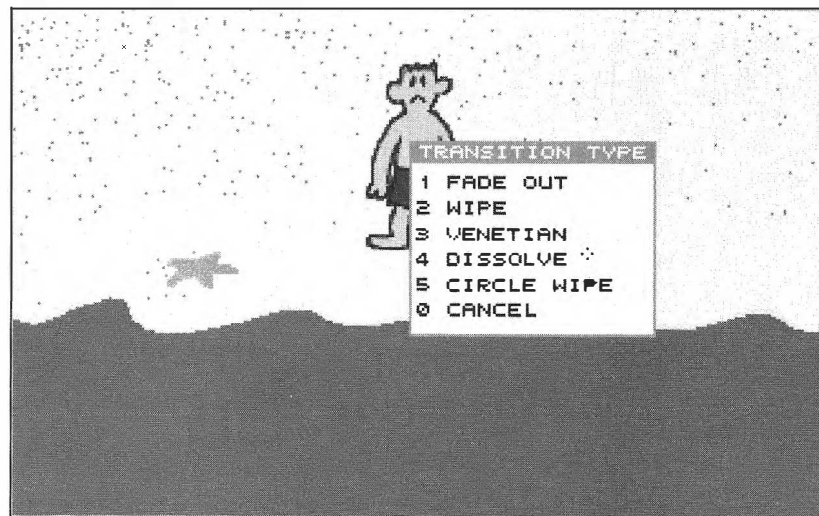
On frames panel, insert four duplicates of frame 12, for a total of 24 frames, and set play speed to 10.

Play the flic and save it as GUYBLINK.FLI.

---

### ***Animator's Automatic Transitions***

Animator provides a choice of automatic transitions for joining two flics. When you select TRANSITION instead of CUT during a joining, the submenu of transition options appears.



*Selecting Dissolve From TRANSITION TYPE Submenu*

The transitions submenu gives you the following choices:

- FADE OUT darkens the last frame of the first flic to black and then lightens the first frame of the second flic from black to its full complement of colors.
- DISSOLVE turns the last frame of the first flic into a screen full of dancing, wiggling pixels which are gradually replaced with the first frame of the next flic.
- WIPE replaces the last frame of one flic with the first frame of the next flic one row at time, moving down from the top of the screen.
- VENETIAN is a wipe in which the first frame of the second flic is gradually revealed in a pattern resembling the slats of venetian blinds, gradually expanding to fill the screen.



- **CIRCLE WIPE** is another patterned wipe in which the first frame of the next flic is gradually revealed in an ever-expanding circle starting from the middle of the screen.

The default number of frames for a transition is 16. You can set another number before the joining begins.

### ***Joining Two Flics with a Dissolve***

Now that both flics are ready, you'll join GUYRAIN.FLI to the start of GUYBLINK.FLI. First, you'll select JOIN on the FLIC menu and select TRANSITION, then you'll select DISSOLVE.

---

## **Joining the Rainy City and the Beach**

Continue from previous exercise, or load GUYBLINK.FLI.

Open **FLIC** Select **JOIN** Select **TO START**

Enter **GUYRAIN.FLI**

Select **TRANSITION**

Select **DISSOLVE**

Click **OK** Accepts default setting of 16 frames for transition.

Play flic and save as GUYSJOIN.FLI.

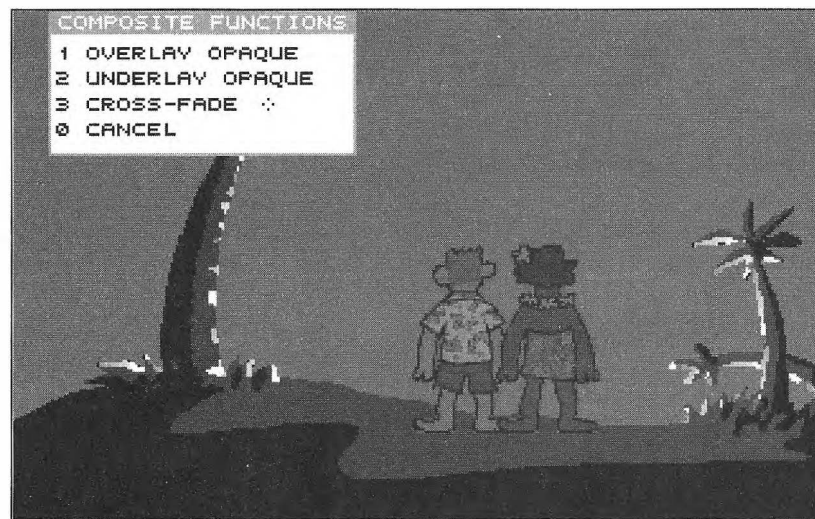
---

In the full animation, the appearance of the lonely guy in the rain is preceded by the fantasy sequence you'll composite over him later. The blinking guy will be soon joined by the gal on the beach and then by the rest of the exercisers.

## **Compositing the Sunset With a Cross-Fade**

The beginning of the Club Baltic animation is the color cycling sequence from Chapter 10, which features a couple raptly watching the last rays of the setting sun glance off the palm trees on the beach. The colors glimmer and die away until the scene is visible only as a silhouette. In this section, you'll put the sequence together by compositing SUNSET.FLI with SILHOUET.FLI.

To create the effect that the sun is going down and nightfall is overtaking the couple, you'll composite the silhouette and the color cycling with CROSS-FADE, which will gradually bring in the second flic while the first flic fades out. At the end, the silhouette will have entirely replaced the sunset scene. You'll begin compositing SILHOUET.FLI at frame 33 of SUNSET.FLI so that the colors will go through one complete cycle before darkening. The silhouette and the sunset scenes are identical except for colors. You want them to remain registered, so don't reposition the frame of SILHOUET.FLI before compositing.



*Selecting COMPOSITE CROSS-FADE*

---

### Compositing the Sunset With a Cross-Fade

Type **fry**



Load IN10SUNS.FLI.



Load SUNSET.FLI.

Jump to frame 33.

Open **FLIC** Select **COMPOSITE**

Select **CROSS-FADE**

Select **SILHOUET.FLI**, or **IN10SILH.FLI** from the **IN DISK**.

Right click screen Click **YES**

Sets frame without repositioning and starts compositing.

Select **KEEP CURRENT COLORS**

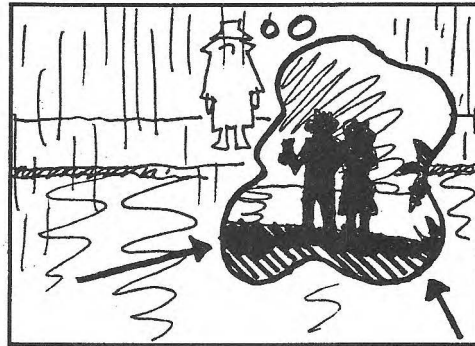
Set play speed to 10, play flic, and save as **SUNFADE.FLI**.

## Compositing the Fantasy Sequence

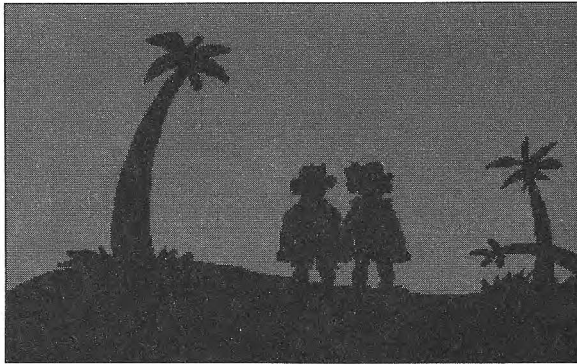
As soon as the colors of the sunset fade away on the beach, the darkened scene begins to shrink. It's revealed to be inside the sort of balloon that typically hovers over cartoon characters to show what's going on in their heads. Alas, the opening scene of the Club Baltic animation turns out to be but a fragment of the lonely guy's fantasy.



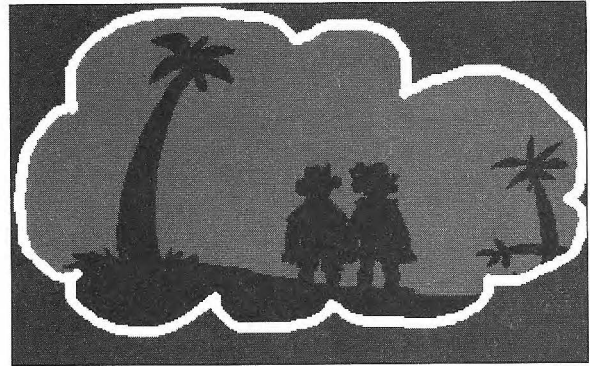
*Fantasy Sequence in Storyboard*



In this section, you'll create a flic of the shrinking fantasy balloon and composite it over the guy in the rain. The image inside the fantasy balloon is the last frame of **SUNFADE.FLI**, so you'll clip it to the swap screen before making a new flic of 24 blank frames.



Last Frame of SUNSET.FLI

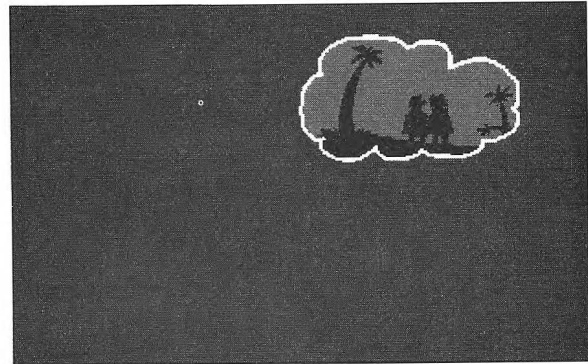
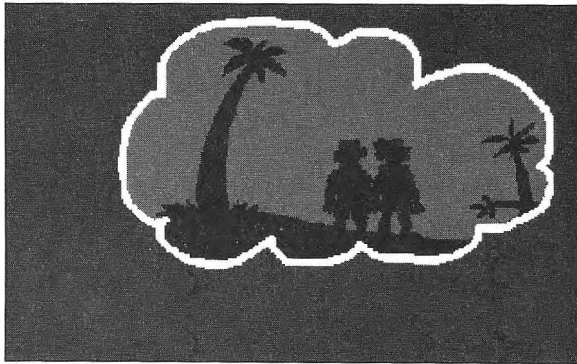


Balloon Drawn

Next, you'll paste the silhouette from the swap screen onto frame 1, clip the image as a cel, and paste it on frame 2. On frame 2 you'll draw the balloon with a large brush and the shape tool, fill in the areas outside the balloon with the key color, and clip the balloon as a cel.

**NOTE** *Fill all bits of the nearly black purple first — once the remnants of the blue sky are filled, it's hard to distinguish the purple from black. You can test the results with SEPARATE on the PIC menu by replacing the purple (select inside the balloon) with a bright color. Then you can clean up any leftovers with the key color, and use SEPARATE again to restore the purple in the balloon, retrieving the purple from frame one.*

You'll use the optics panel to move the balloon cel up and to the right, shrinking it at the same time. Setting the MOVE sliders for the X and Y axes will accomplish the move. To shrink the balloon, you'll use the REDUCE slider for SIZE.



*Fantasy Balloon Moving Up and Back*

Because the ever enlarging area outside the shrinking balloon is in the key color, it will reveal more and more of the glum guy and his gloomy scene when composited. The balloon ends up to his right, as in the illustration.

---

### Creating the Fantasy Balloon

Continue from previous exercise or load SUNFADE.FLI.

Display frame 48 (the last frame).

Type **sc** Clips to swap screen.

Type **fry**

On frames panel, create 24 blank frames, set a segment from frame 2 to frame 24, and return to home panel.

Display blank frame 1.

Type **sp** Pastes swap screen.

Display blank frame 2.

Type **sp**

Replace spray tool with shape tool on drawing tools panel, turn off filled option, and return to home panel.

Right click **brush**

Select a size 6 brush.

Click **mini-palette**

Select white as current color.

Use **SHAPE**

Draw a balloon, as illustrated, covering most of screen.

Click **key color** Use **FILL**

Fill in all areas outside of balloon with key color.

Press **<tab>**

Clips image as cel.

Now you can animate the fantasy balloon on the optics panel. The first frame will remain the same, with the full-sized image of the couple in silhouette on the beach. From frame 2 to frame 24, the fantasy balloon will move up and to the right while shrinking.

## Animating the Fantasy Balloon

Type <b>x</b>	Clears frame 2.
Type <b>opc</b>	Displays optics panel, all settings cleared.
Open <b>ELEMENT</b> Select <b>CEL</b>	

Click **CENTER** Click **DEFAULT** Defaults to center of cel.  
Click **MOVE** Set X axis (top slider) to 75 and Y axis (middle slider) to -50.  
Click **WIREFRAME** Check movement of image up and right as wireframe rectangle.

Click **SIZE** Click **BOTH**      Set reduce slider to 25.

Check wireframe movement again, shrinking up and right.

**Click USE**

**Make sure TO SEGMENT is on, then preview movement on time select panel and render it.**

Play flic and save as FANTASY.FLI.

GUYRAIN.FLI is ready to be composited as an underlay so that the guy in the rain shows through wherever the key color appears in FANTASY.FLI.

## Compositing the Fantasy Balloon

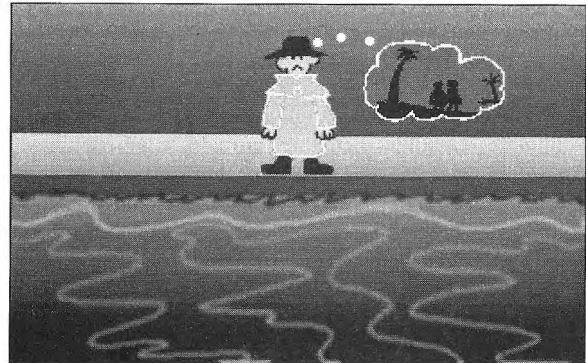
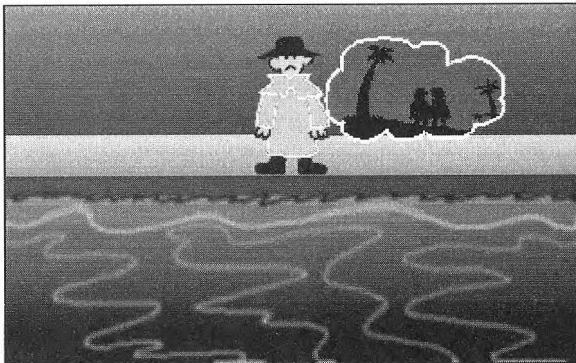
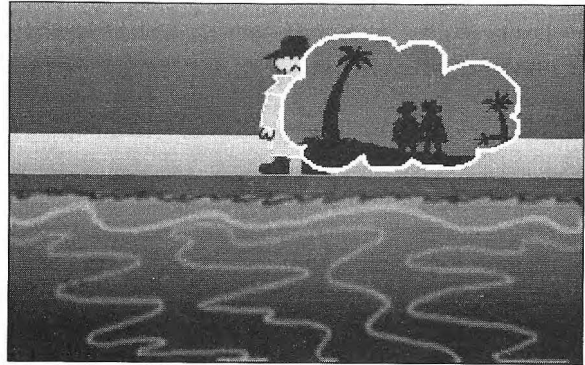
Display frame 1 of FANTASY.FLI.  
Make sure the key color is the default black in register zero.

Open FLIC Select COMPOSITE  
Select UNDERLAY Select GUYRAIN.FLI as flic to be underlaid.  
Select KEEP CURRENT COLORS

Right click screen Click YES

Sets default position for frame 1 of GUYRAIN.FLI and begins compositing.

Set play speed to 10, play flic, and save as FANTASY.FLI.

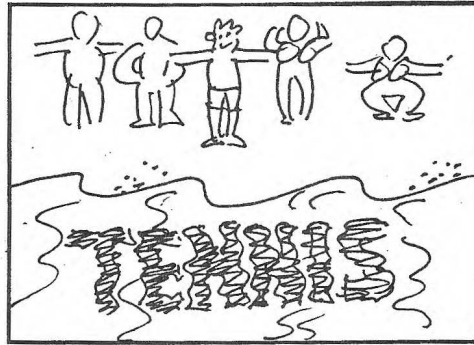
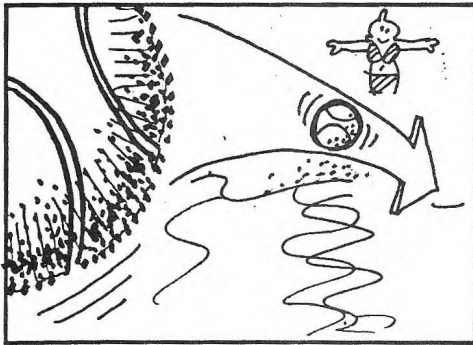


*Fantasy Balloon Composited Over Guy in Rain*

**MORE** For a finishing touch, you can put a few small bubbles between the balloon and the guy's head, using the circle tool with white ink and the [F] button on.

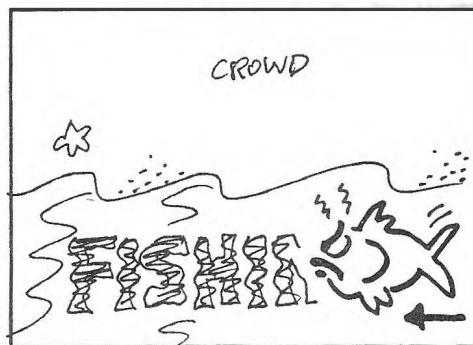
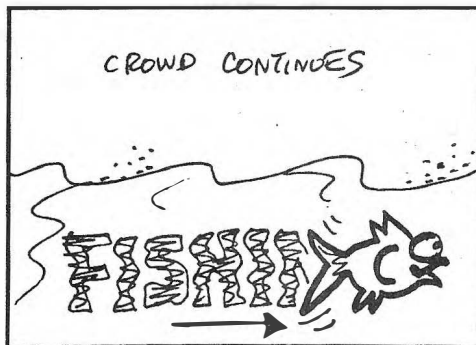
## Joining and Compositing the Titled Sequences

In the middle of the Club Baltic animation, two titled sequences appear, identifying recreational pursuits one can pursue in between aerobics. First, a tennis ball is lobbed out over the water and hovers there, until it's replaced by the "TENNIS" title, seemingly floating under the waves. After wiggling and fading in and out, the letters seem to break up and disappear.



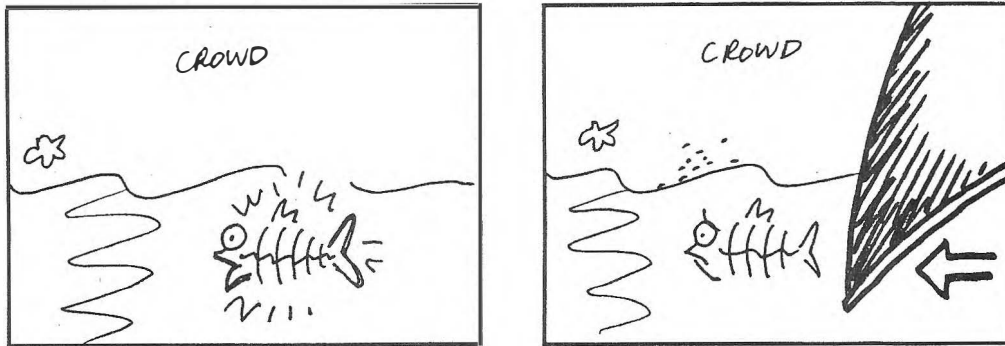
*Tennis Sequence in Storyboard*

The fishing sequence follows, consisting of the "FISHING" title and the fish metamorphosis. The storyboard shows the fish swimming across from the left and the title appearing in his wake, while the exercisers continue to go through their motions on the beach. The fish comes back from the right and reads the title, becomes offended, but before he can get away, turns into a skeleton.



*Fish Turns Into Skeleton*





*Fish Turns Into Skeleton*

The following sections illustrate how to join the parts of the “FISHING” and “TENNIS” titles you created in Chapter 9 and composite them, together with the fish metamorphosis from Chapter 11 and the tennis ball sequence from Chapter 12, onto the beach background. The exercises take you through the steps required to join and composite the fish metamorphosis and its title. You’ll see how to have one animation reveal other elements or animations, a powerful technique frequently used in television commercials.

Repeating the basic procedure for the tennis ball and its title is optional. If you want to do so, you will find a description of the steps that are different from those for the fishing sequence at the end of this section.

### ***Joining the Fishing Title***

In Chapter 9 you prepared two flics for the fishing title, FISHIN01.FLI and FISHIN02.FLI, each seven frames long, which were colored with decreasing and increasing levels of glass ink. Now you’ll join these two flics with no transition, to create the impression that the title is moving with the roll of the water.

Because the title will be part of an overlay composited on the beach background, you’ll change the background to the default black key color. The marine blue background was essential during the softening and splitting of the text in Chapter 9. Had the background been black from the outset, black pixels would be mingled with the softened, split, glass ink at the edges of the titles when composited.

After changing the background, you'll join the new flic to itself, save it, and join it again in order to expand the cycle to 56 frames. This number will be sufficient for compositing the fish swimming back and forth over the title and the beginning of the metamorphosis.

---

### Joining the "FISHING" Title

Type **fry**



Load IN09FSH1.FLI.



Load FISHIN01.FLI.

Open **FLIC** Select **JOIN**

Select **TO END**

Select FISHIN02.FLI, or IN09FSH2.FLI from IN DISK, as flic to be joined.

Select **CUT**

Makes continuous flic of 14 frames.

Click **key color**

Selects default black key color from register zero as current color.

Click **[T]** button

Turns on [T] button so all frames will be changed.

Open **PIC** Select **SEPARATE**

Click **screen**

Click on blue background.

On the time select panel, select **RENDER** and all frames are changed to black background.

Save flic as FISHIN03.FLI.

Quadruple FISHIN03 by joining it to itself and saving it under the same name, twice, using your macro if you made one. You'll create a total of 56 frames.

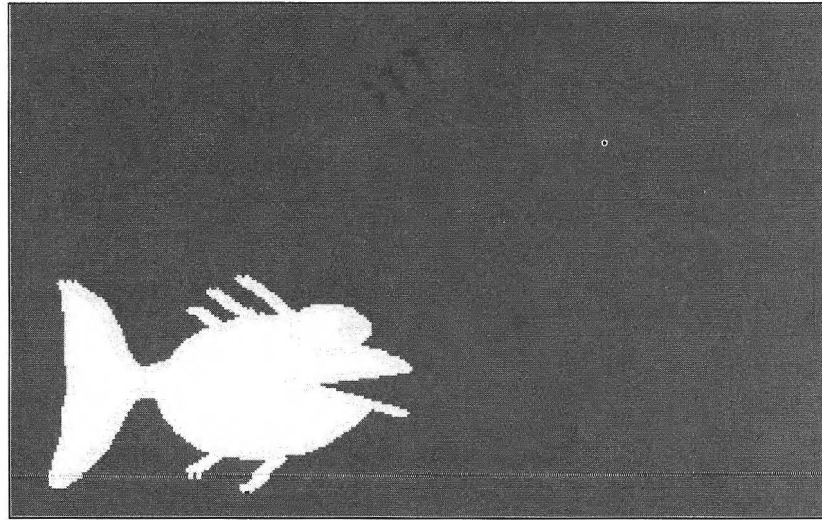
Play the flic and save again as FISHIN03.FLI.

---

Now FISHIN03.FLI has 56 frames, four cycles of the complete movement of the title against the default black key color background.

### *Animating the Fish*

The drawing of the fish you made in Chapter 9, FISH02.GIF, is the basis for the fish who swims past and reveals the title in his wake. To create this part, you'll color the fish, make a cel of it so you can move it down left where it starts off in the water, and paste it there.



*Fish Cel Pasted*

To reveal the title bit by bit, you'll fill most of the background with the same black as the key color (RGB 0,0,0), but from a different color register than register zero. Leave the area between the fish's tail and the left edge of the screen filled with the key color in register zero. When you composite the title under the fish, only the area behind the fish's tail will appear, because the rest of the screen will not be in the key color. As the fish moves across the screen, more and more of the title will be revealed under the key color.

---

### Preparing the Fish Drawing

Type **fry**



Load IN11FISH.GIF.



Load FISH02.GIF.

Color the fish with a bright yellow from the cluster box, or more elaborately if you like.  
Change background color to key color.

Press **<tab>**

Clips fish to cel buffer.

Type **x**

Clears screen, leaving default black background.

**Type** Move cel down on left, leaving room between tail and edge of screen, and click to paste, as illustrated.

Save cel as FISH03.CEL.

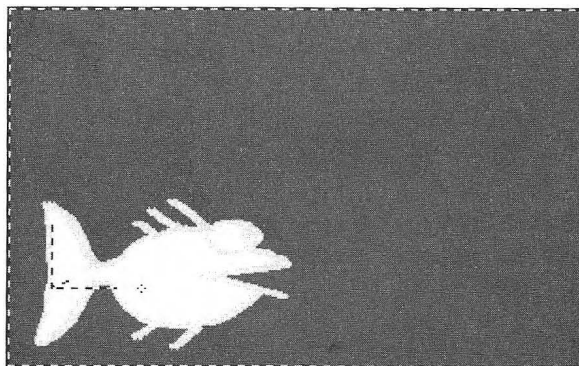
On palette panel, select color fifth from right on bottom row of color matrix as current color (an alternative black, RGB 0,0,0 that's not the key color), and return to home panel.

**Click DRAW** With entire screen displayed, draw a line from top of screen down along left side of fish's tail to bottom of screen.

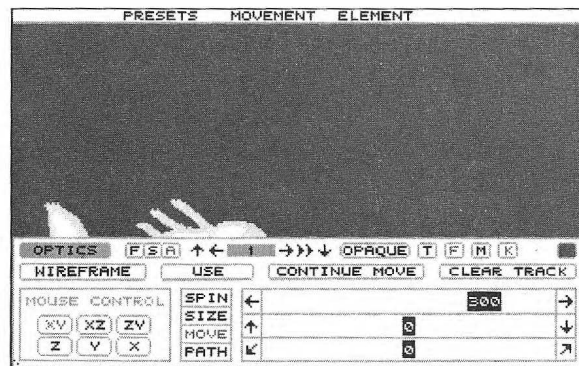
**Click FILL** Fill area to right of line with alternative black color.

---

You won't see any difference in the two areas of the background, because they are filled with the same color; however, one of them is not the key color.



*Setting the Flic's Center*



*Setting the Move*

Before compositing the title under the fish, you'll use the optics panel to move the fish across the screen as a flic, and you'll insert 28 blank frames at the end to accommodate the four cycles of the title.

---

## Animating the Fish

On frames panel, make 30 frames and return to home panel.

**Type opc**

**Click CENTER**

*Display optics panel, all settings cleared, flic selected as element. Click screen twice to pick up center icon, move cursor and click to set center of flic at far left edge, level with fish, as illustrated.*

Click **MOVE**

Click **WIREFRAME**

Click **USE**

Set X axis slider to 300.

The rectangle representing the whole frame should move across the screen from left to right.

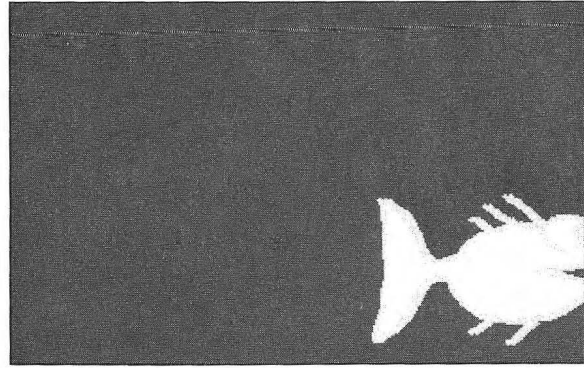
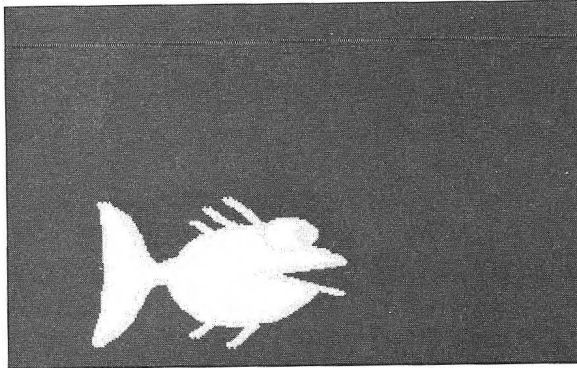
Preview and render the movement.

Insert one frame after frame 30 and display it (frame 31).

Type **x** Clears frame 31 to the black key color.

Insert 27 frames after frame 31 for a total of 58 frames.

Play flic and save as **FISH.FLI**.

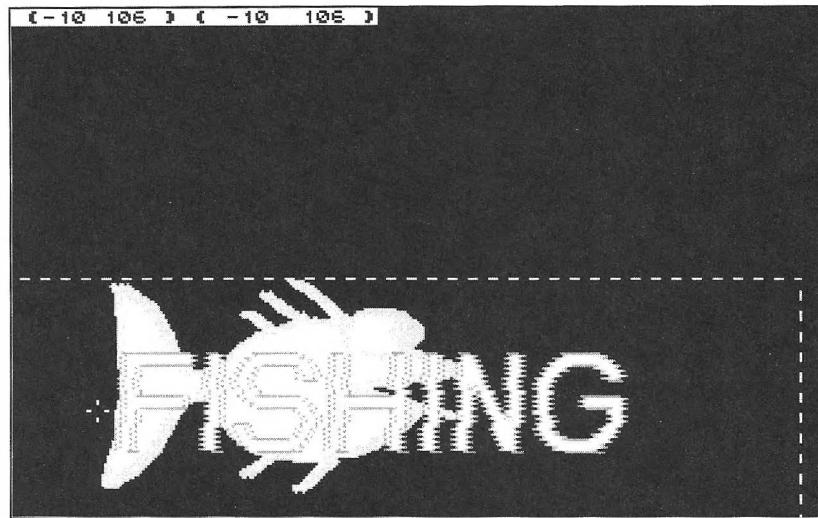


*Fish Moving Across*

When you play the flic, the fish moves across the screen from left to right and the last part of the flic is blank. You cannot see any difference between the area of the background in the key color and the rest of the background.

### ***Compositing the Title Under the Fish***

Now the fish is ready for you to composite the title as an underlay. To give the fish a head start on the screen, you'll begin compositing on frame 3. The key color should be the default black color.



*Title Positioned for Compositing Under Fish*

After compositing, you'll change the rest of the background to the key color by setting the near option for the separate tool and then using SEPARATE on the PIC menu with the [T] button turned on. The near option changes all colors with values the same as or close to the selected color (up to a range of ten, the default setting), even though the colors are in different matrix slots. This makes the default black key color the only background color on each frame, so compositing over the beach will work correctly later.

---

### **Compositing the Title Under the Fish**

Display frame 3 of FISH.FLI.

*Select* **FLIC** Open **COMPOSITE**

*Select* **UNDERLAY**

Select FISHIN03.FLI as flic to be composited under FISH.FLI.

*Click screen* **Move cursor**    *Position* title so "F" is just inside fish to right of tail.

*Click screen* **Click YES**      *Sets* position and starts compositing.

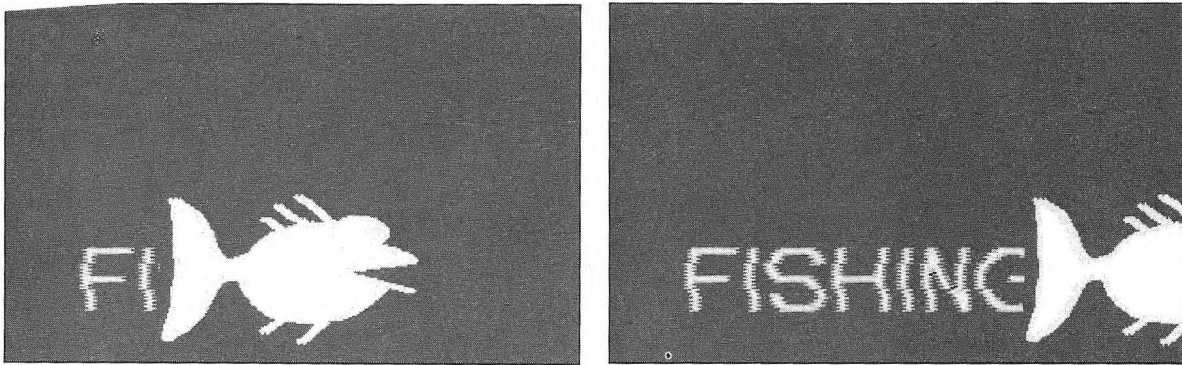
Replace spray tool with sep. tool, and click on NEAR on drawing tools panel.

*Click key color*                      Selects default black key color as current color.  
*Click [T]*                              Turns time select on.  
*Open PIC Select SEPARATE*      *Click on black background.*

On time select panel, render new color for entire background of whole flic.

Play flic and save as FISHCOMP.FLI.

---



*Fish Composited Over Title*

### ***Compositing the Fish Titling Sequence on the Beach***

To complete this part of the fishing sequence, you'll composite the flic you created in the previous exercise, FISHCOMP.FLI, as an overlay onto BEACH02.FLI. Starting on frame 1, the compositing will take up the first 58 frames. Bringing the flic in as an overlay, you'll be able to position the fish and title in the water.

---

### **Compositing the Fish and Title in the Water**

Load BEACH02.FLI.

*Open FLIC Select COMPOSITE*  
*Select OVERLAY*

*Select FISHCOMP.FLI as flic to be composited over*  
*BEACH02.FLI.*

Select **KEEP CURRENT COLORS**

Click **screen** Move cursor

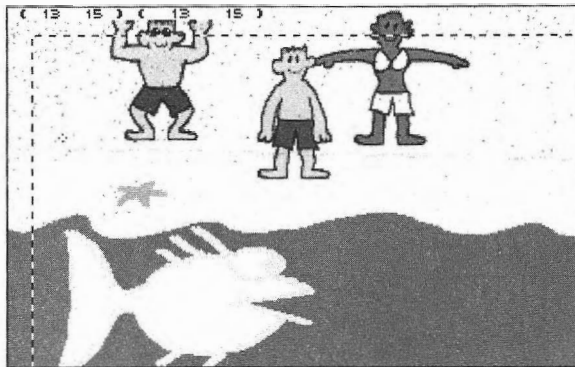
Click **screen** Click **YES**

Position fish in water.

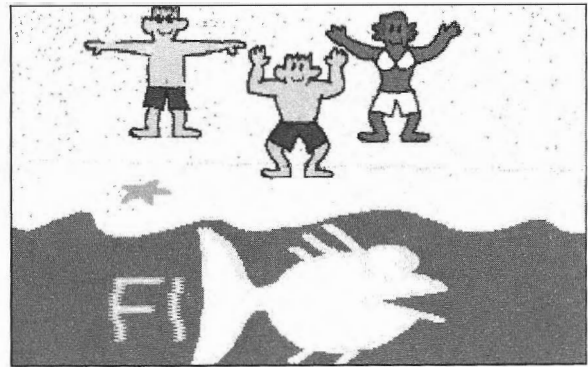
Sets position and starts compositing.

Make sure speed is set to 10, play flic, and save as BEACHFSH.FLI.

---



*Positioning the FISHCOMP Flic*



*Fish Revealing "FISHING" Under Water*

### ***Flipping the Fish and Bringing It Back***

Now that the fish and the fishing title are composited onto the beach background, the fish disappears off screen on the right at frame 39, but the title remains. The next step is to bring the fish back so that it reads the title and knows its fate. To do this, you'll make another flic of fourteen frames in which the fish has reversed its direction and swims back onscreen from the right.

Because the fish will be offscreen at the beginning of this sequence, you won't be able to position the first frame before compositing it. To register the fish, you'll move the fish cel into position on frame 16 of BEACHFSH.FLI, which is the position you want the fish to end up at. Then you'll clear out BEACHFSH.FLI, paste the fish cel, and make fourteen frames.

To flip the new fish flic, you'll use the optics panel's SPIN TURNS option, centering the flic in the center of the fish, and setting a half turn on the Y axis (the equivalent of turning it 180 degrees). Then you'll reset the optics panel, move the flic offscreen to the right with



the X mouse control button and render the flic in reverse. It will then be ready to composite starting on frame 31.

---

### Bringing the Fish Back

BEACHFSH.FLI should still be loaded and the updated FISH02.CEL should still be in the cel buffer.

Display frame 16 of BEACHFSH.FLI and move the fish cel into position on top of the fish.

Type **fry**

Type **` Right click screen** Pastes fish cel without moving it.

Make 14 frames and display the optics panel.

Click **CENTER Click screen** Set the center of the flic in the center of the fish.

Click **TURNS** Click on 1/2 turns below sliders and set Y slider (middle) to -1.

Open **MOVEMENT Select STILL** Applies final position of turn to all frames, flipping fish 180 degrees.

Check wireframe, preview, and render the flic.

Open **PRESETS Select CLEAR ALL**

Click **CENTER Click screen** Set center of flic in center of fish again.

Open **MOVEMENT Select STILL** Turns off still option for next move.

Click **MOVE Click screen** Move flic about 3/4 offscreen to the right.

Open **MOVEMENT Select REVERSE** Reverses optics move.

Check wireframe, preview, and render.

Save flic as FISH.FLI.

Composite FISH.FLI as an overlay onto BEACHFSH.FLI starting at frame 31.

Play flic and save again as BEACHFSH.FLI.

---

The fish should swim back and end up facing the fishing title.

### Compositing the Fish Skeleton Metamorphosis

The last step in putting together the fish titling sequence is to composite the metamorphosis as an overlay onto BEACHFSH.FLI, starting on frame 44 so that it continues from the last frame of the fish sequence you just added. First you need to flip the flic you made in Chapter 11, FISHSKEL.FLI, using the same technique to flip the fish skeleton metamorphosis as in the previous chapter: centering the

flic element in the center of the fish on frame 1 and turning the flic 180 degrees with **STILL** on. You'll then insert four frames after frame 1 to hold the fish in place while it reads the title.

Then you'll save the flipped flic as **FISHSKEL.FLI**. The compositing is straightforward. You'll load **BEACHFSH.FLI**, display frame 44, and make sure that the key color is the light blue background of the flic you're compositing. After selecting **FISHSKEL.FLI**, you'll position the first frame so that the two fishes are registered.

**MORE** *To add a sequence at the end showing the fish skeleton swimming away, you would add another nine frame cycle to the end of **BEACHFSH.FLI** and animate the fish skeleton for about ten frames at the end of the metamorphosis before compositing.*

---

## Flipping and Compositing the Fish Skeleton Metamorphosis

Type fry



Load **IN11FSKL.FLI**.



Load **FISHSKEL.FLI**.

On optics panel, center the flic in the center of the fish.

Click **TURNS**

Set turns option to 1/2 and set Y slider (middle) to -1.

Open **MOVEMENT** Select **STILL**

Applies final position of turn to all frames, flipping fish 180 degrees.

Preview and render the flic.

Insert four duplicates after frame 1 and save the flic again as **FISHSKEL.FLI**.

Load **BEACHFSH.FLI** and display frame 44.

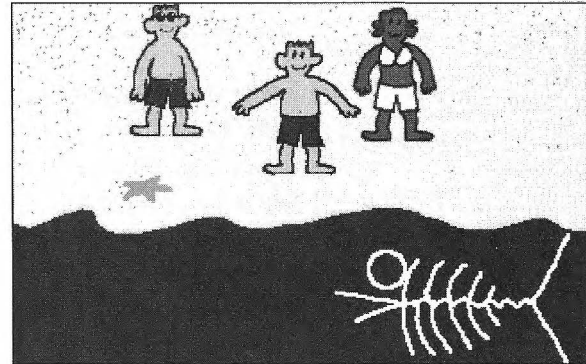
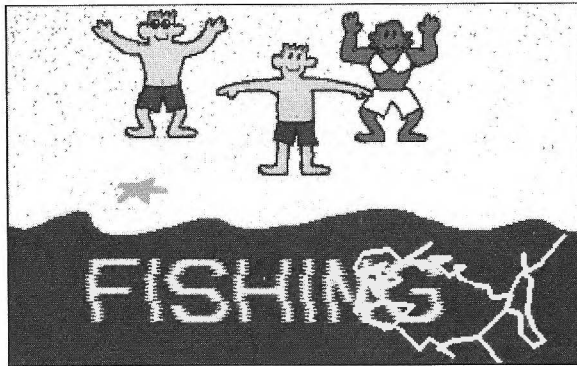
Make sure the key color is the light blue of the mini-palette.

Composite **FISHSKEL.FLI** as an overlay onto frame 44 of **BEACHFSH.FLI**.

Position the metamorphosis flic over the fish.

Play the completed flic and save it as **BEACHFSH.FLI**.

---

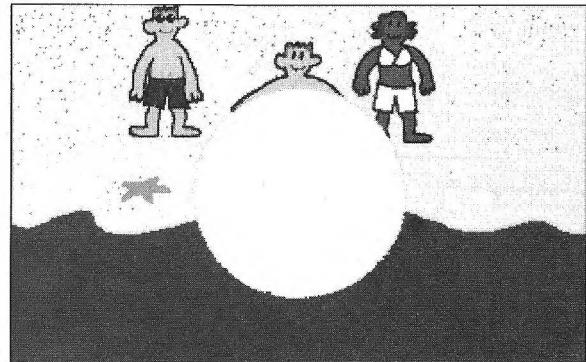
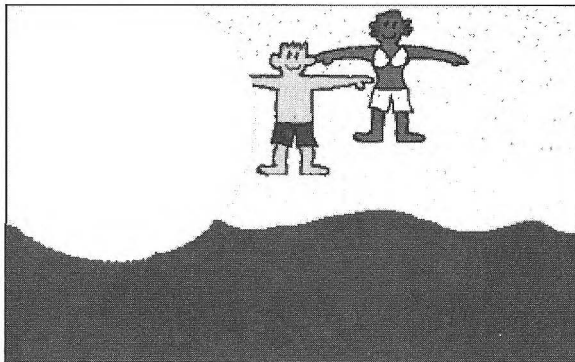


*Fish Metamorphosis Composited Onto Beach Background*

**MORE** You can go back and change the expression of the fish so that it's doing a double-take at the beginning of the metamorphosis. You might also fill in the frames of the fish in the early stages of the metamorphosis to match the preceding frames.

### ***Ending the Tennis Sequence With a Dissolve***

Compositing the tennis sequence involves techniques you've already learned in this chapter. The flic made in Chapter 12, TBALL.FLI, of the tennis ball arcing across the screen is ready to composite as an overlay onto the first 36 frames of BEACH02.FLI. The two halves of the "TENNIS" title you made in Chapter 9 need to be joined.

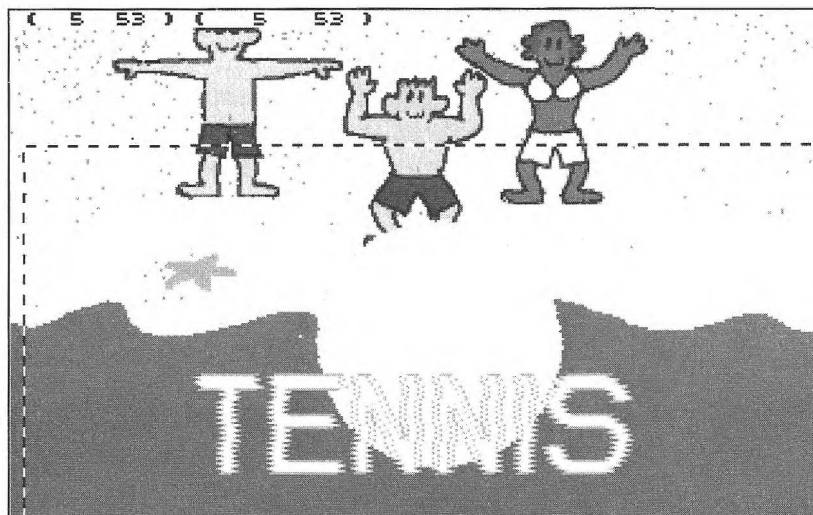


*Tennis Ball Composited Onto Beach Background*

The following exercise shows one new technique you'll likely find other opportunities to use. That is how to end a flic with a dissolve.

As you've seen, Animator's automatic dissolve is a transition between two flics. The simplest way to have a dissolve at the end is to make one blank frame and join the flic to the start of it.

After the "TENNIS" title is ready, you can composite it as an underlay onto BEACH02.FLI, bringing it in beneath the last couple of frames of the tennis ball in the water. The marine blue background of the title flic is the identical color of the water in the beach scene; both should be selected as the key color before compositing. Then you'll create a single blue frame and join the "TENNIS" title to the start of it with a transition, dissolving the title into the blue frame.



*Positioning the "TENNIS" Title*

---

### Joining and Compositing the Tennis Sequence

*Type fry*

Load BEACH02.FLI and composite TBALL.FLI as an overlay without adjusting the frame's position, starting on frame 1.

Play flic and save as BEACHTEN.FLI.

*Type fny*



Load IN09TEN1.FLI, join IN09TEN2.FLI to end, and save as TENNIS03.FLI.



Load TENNIS01.FLI, join TENNIS02.FLI to end, and save as TENNIS03.FLI.

Make sure [T] is off.

Make marine blue background color (source 111 on color matrix) the current color and the key color.

Type **fny**

Clears out flic, leaving blank frame in default black key color.

Type **pa**

Fills screen with marine blue.

Open **FLIC** Select **JOIN**

Select **TO START**

Select TENNIS03.FLI or IN09TENN.FLI from IN DISK.

Select **TRANSITION** Select **DISSOLVE**

Enter 20 for number of transitional frames.

Play and save as TENNIS03.FLI.

Load BEACHTEN.FLI and display frame 35.

Position cursor over water and press <F1> to make sure it is the same as the key color (key color should remain highlighted).

Open **FLIC** Select **COMPOSITE**

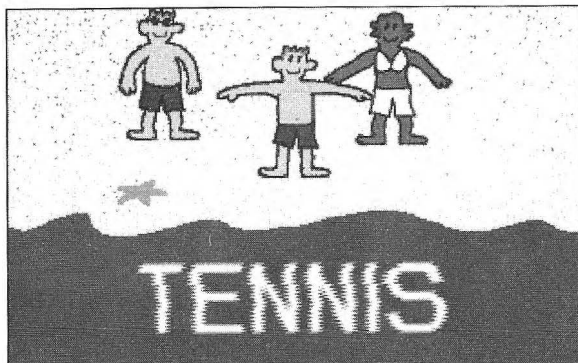
Select **UNDERLAY**

Select TENNIS03.FLI.

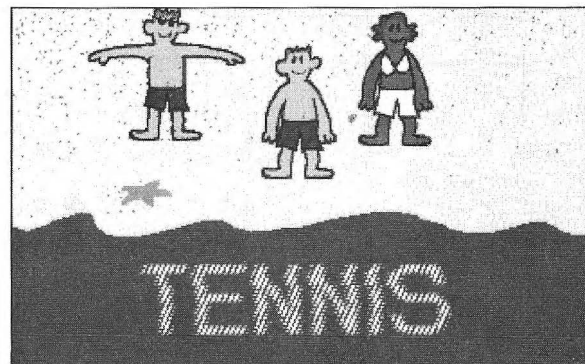
Select **KEEP CURRENT COLORS**

Position the title centered in the water, with the end letters beneath the tennis ball, as illustrated.

Play flic and save as BEACHTEN.FLI.



"TENNIS" Title Composited Onto Beach



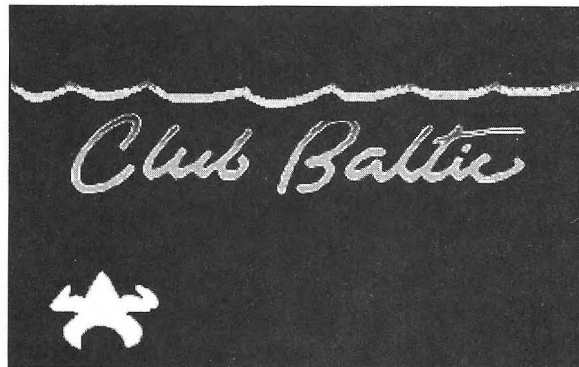
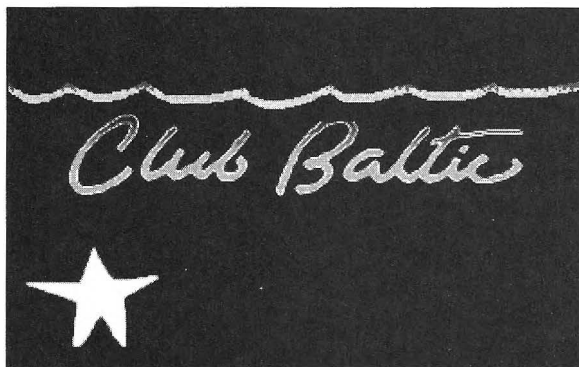
"TENNIS" Title Dissolving

## Finishing Touches

The last sequence of the Club Baltic animation begins with the windsurfer wiping across, leaving the couple on the beach at twilight. They face us as the frame flips up, the starfish falls off, and the Club Baltic logo writes on. For the last flourish, the starfish starts exercising beneath the logo.

By now you're so adept at compositing and joining flics, you're probably saying, "Aha! I know how to go about animating the last sequence. I've learned all the techniques it requires and I have most of the elements already prepared!"

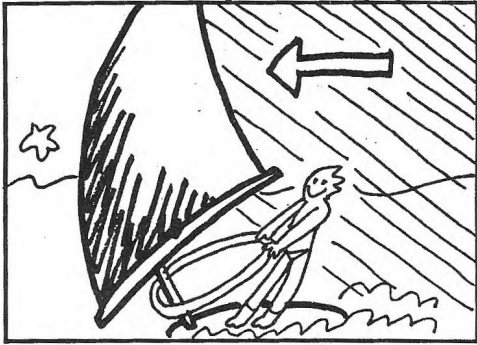
In case those are not your exact words and you would like to complete the animation, this section tells you how to do so. You have indeed learned all the requisite techniques and have prepared most of the elements in previous chapters, so formal exercises would be needlessly repetitious. If you have the IN DISK, the Club Baltic logo that is the basis of the write on is IN13LOGO.GIF.



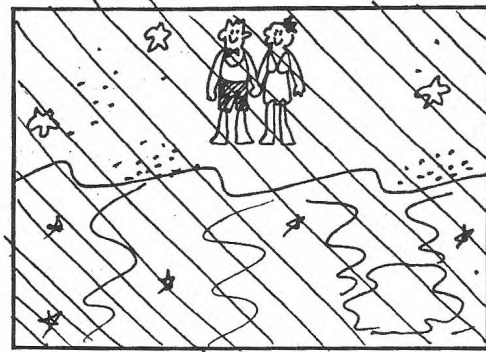
*Starfish Composited on Club Baltic Logo*

### *Adding the Windsurfer*

After all the moving elements have appeared against the beach background, one of the Club Baltic athletes windsurfs on from the right. A brisk breeze ruffles his hair as it propels the craft across the screen. In its wake, the scene changes to twilight and when the windsurfer is gone, only the guy and gal remain on the beach, now dressed for the evening.



*Windsurfer Wipes Across*



*Couple Remains on Beach at Twilight*

To add the windsurfer, you would first draw a large sail filled with wind and the windsurfing board, making the image as large as the screen allows. Then you would take a cel of one of the exercisers, change the position of the arms so that the character is holding on firmly, and paste the cel in place on the craft.

You have several options for animating the sequence. Probably the simplest — and the way to have greatest control and most painterly results — is the most classical technique, creating a wipe by hand. Make a separate flic of the last nine frames of BEACH02.FLI and join it in front of one frame of COUPLEF.GIF, from Chapter 8, the couple facing front on the beach. Then make a cel of the windsurfer on the craft and move and paste the cel on each frame of the joined flic so that it sails across the screen when the flic is played. You can go back and darken the background after the craft passes by, to create the illusion of twilight. You could also paste the cel of the windsurfer and craft over the range of frames with the [T] button on and later darken the appropriate areas.

A third technique you can try is a variation of the fish revealing the fishing title. Using the default black key color and another black (0,0,0) from a different color register, draw a line in front of the sail and fill it with the key color. Position the windsurfer and craft as a cel on the right side of the screen, make 20 frames or so, and animate the flic on the optics panel moving the image all the way across and off on the left. Composite the beach with all the exercisers before twilight as

an underlay. Then change the color behind the windsurfer and craft to the key color and composite the twilight scene under it.

### ***Starfish Falls Off***

The flic you created in Chapter 12 of the couple spinning up and back, LOGO1.FLI, would follow at the end of the composited windsurfing sequence. To allow the viewer time to appreciate the transition, you would insert a brief hold by duplicating frame 1 of LOGO1.FLI several times.

Although the scene flipping up is all ready, you would need to make a flic of the starfish falling off and composite it over LOGO1.FLI. To animate the starfish's descent, you would shrink the first frame of STARFISH.FLI, the flic you created in Chapter 8 of the starfish in three exercise positions. Then you'd clip a cel of the shrunk image and move it into position about halfway down the screen on the left side. On the optics panel, you'd put one full spin on the cel and draw the spline path of its fall. A flic of some 16 frames would be sufficient. When this flic is ready, you'd add sufficient still frames at the end of LOGO1.FLI to complete the starfish's optics movement, and begin compositing it around frame 33 of LOGO1.FLI, or at a point you think the scene has flipped back enough for the starfish to topple off.

### ***Club Baltic Logo Writes On***

In the final sequence, the straight line remaining at the end of the scene flipping becomes a wavy line and beneath it, the words "Club Baltic" appear as a write on. The starfish remains stationary at the bottom left of the screen where it landed.

You learned how to do a write on in Chapter 7 and the procedure is the same here. Decide how many frames you want it to take, draw the finished logo, and work backwards, erasing portions of the letters on each preceding frame. The line turning into the wavy line is easiest to do frame by frame with NEXT BLUE. For a more subtle timing effect, it can be finished before the write on is complete.

### ***Starfish Exercising***

When the write on is complete, you can add the exercising starfish. The STARFISH.FLI flic you made in Chapter 8 is the basic cycle. You would shrink this flic and join it to itself until it is 24 frames long.



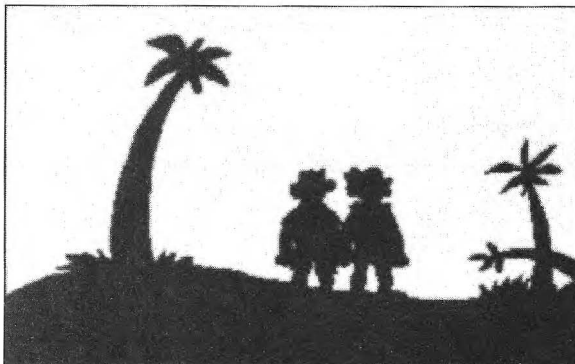
Then you would composite it onto a flic of 24 still frames of the finished Club Baltic logo, positioning the first frame of the starfish exercising at the same place the starfish landed after it fell off the beach.

**NOTE** Now you can delete the following files: *BEACHGUY.FLI, BEACH.GIF, GUY05.FLI, GUYX2.FLI, GAL.FLI, GALX2.FLI, GUYCOOL.FLI, GUYRAIN.FLI, GUYBLINK.FLI, SEAGULL.FLI, SUNSET.FLI, SILHOUET.FLI, all the title, fish, tennis and metamorphosis flics, LOGO1.FLI, STARFISH.FLI.*

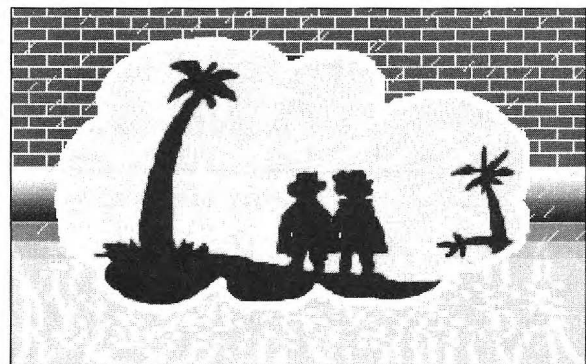
## A Complete Version of the Club Baltic Animation

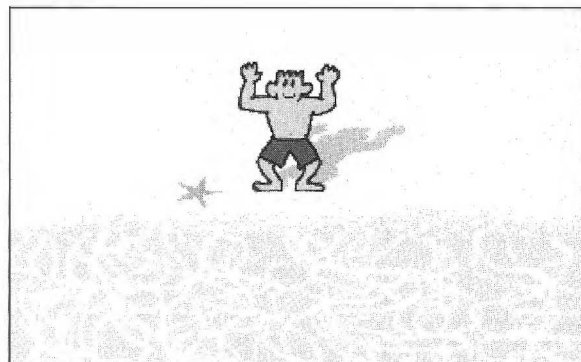
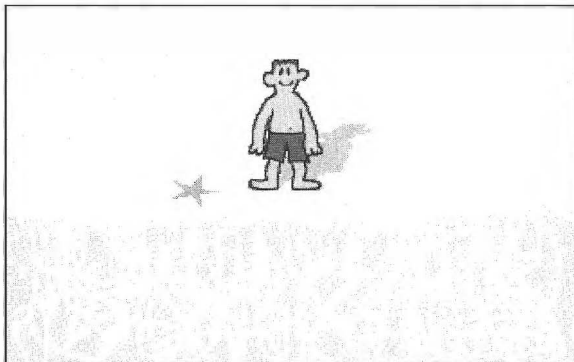
Working from Lee Marrs' storyboard, Robert Quinn has done a complete version of the Club Baltic animation, shown in this section. At times it varies slightly from the sequence you've been creating. The illustration at the beginning of this chapter is Quinn's interpretation of the lonely guy just at the moment his fantasy balloon pops.

In the opening sequence, the guy on the beach is revealed to be enclosed in the fantasy balloon. As it shrinks, the lonely guy is revealed, standing on the sidewalk, water coursing down into the gutter, a wall of grim bricks at his back. After this scene dissolves, he is working out on the Club Baltic sand.



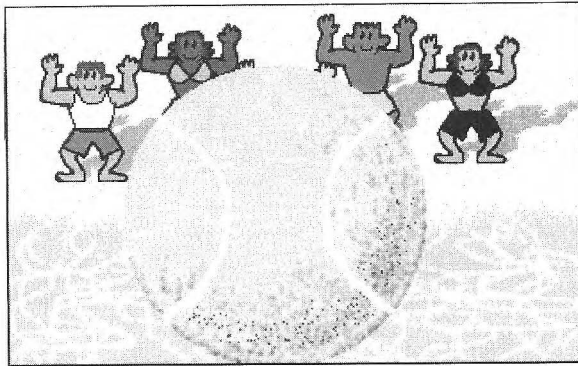
*The Opening Sequence*



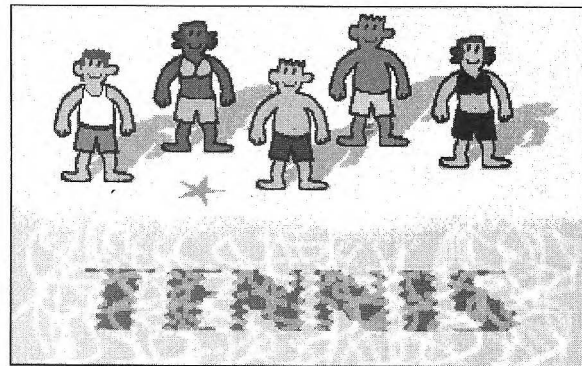


### *The Opening Sequence*

In the frames below, the exercisers on the beach see the tennis ball and its title dissolves in the water. Notice that some of the hairdos are particularly up-to-date.

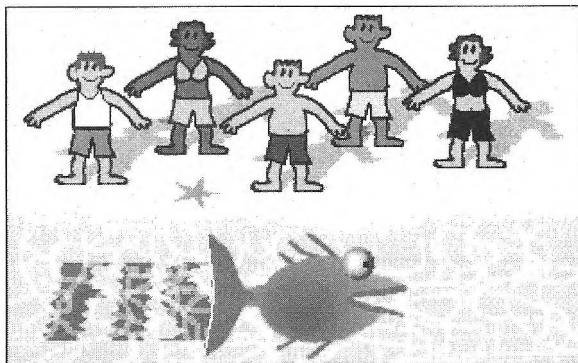


*Exercisers See the Tennis Ball*

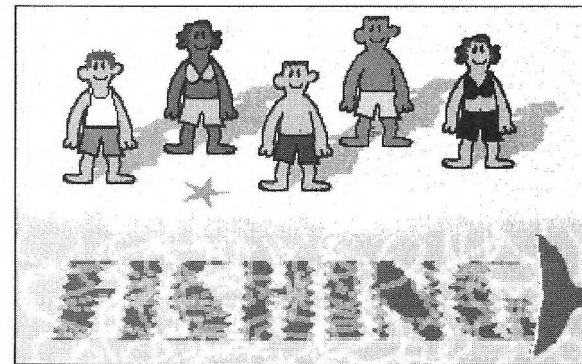


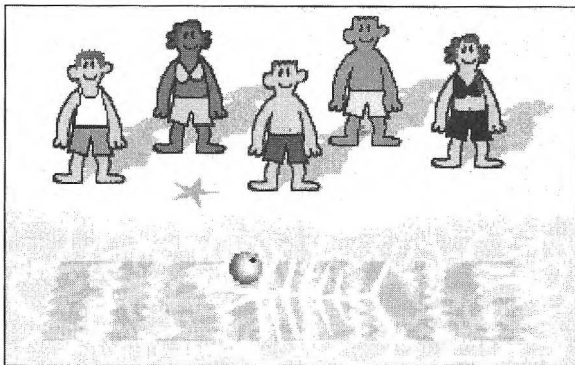
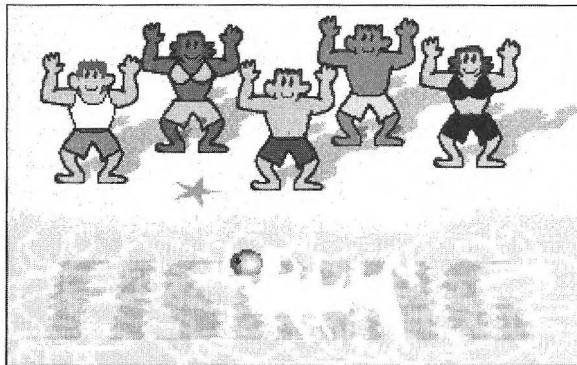
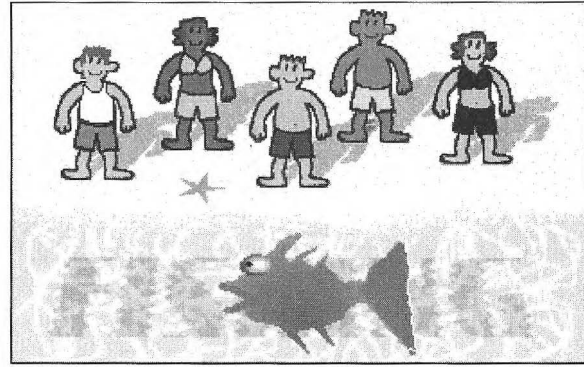
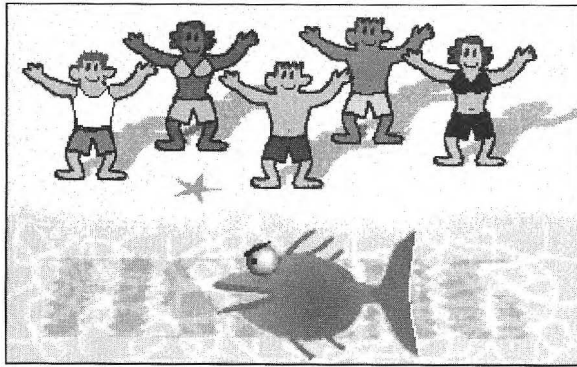
*The "TENNIS" Title*

The next six frames show Quinn's interpretation of the fish doing a double take. He's animated its expression of bemusement turning to angry apprehension before it begins to change to a skeleton.



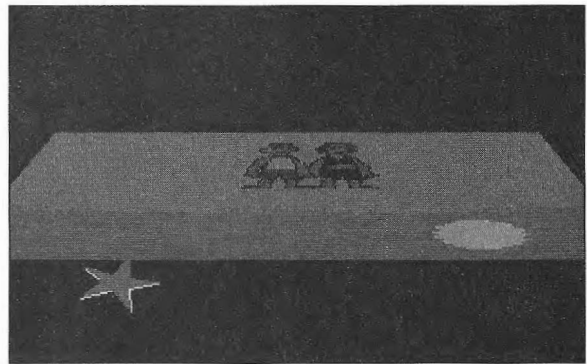
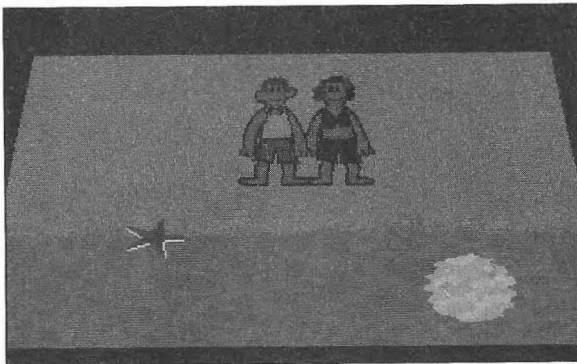
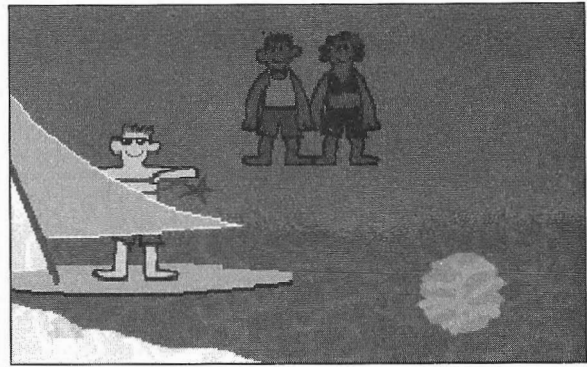
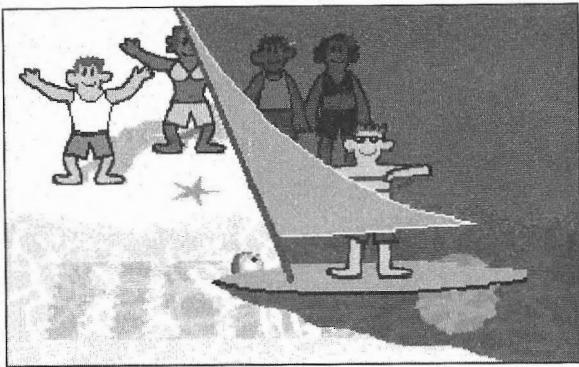
*Exercisers See the Fish Metamorphosis*





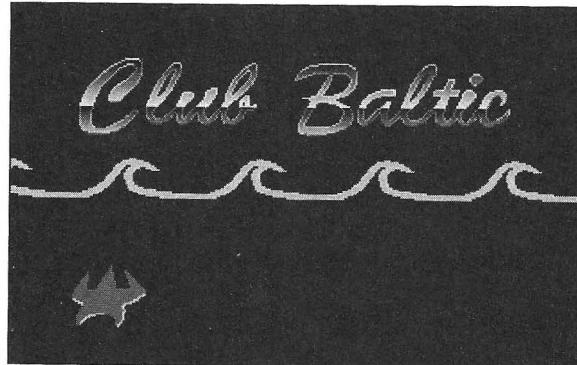
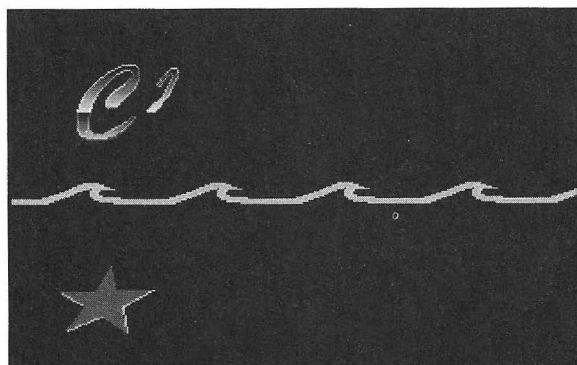
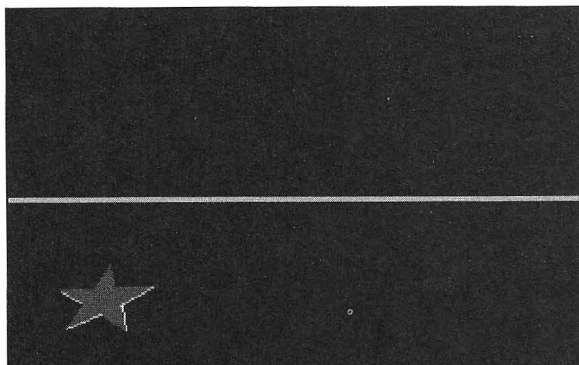
*Exercisers See the Fish Metamorphosis*

The next frames show Quinn's windsurfer wiping across and providing the transition from the exercisers on the beach to the couple alone. The scene begins to flip up and back and the starfish falls off.



*Windsurfer Transition Into Final Sequence*

Finally, Quinn transforms the straight line into the wavy line, the letters of the logo appear, and the starfish begins its exercises.



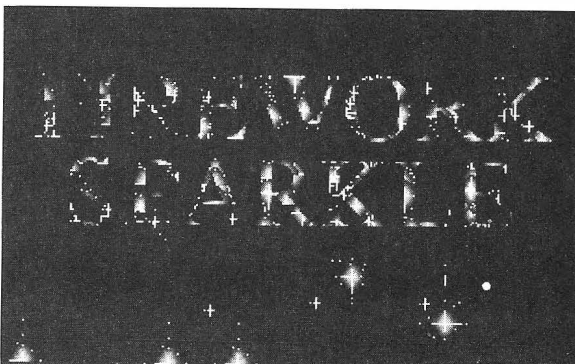
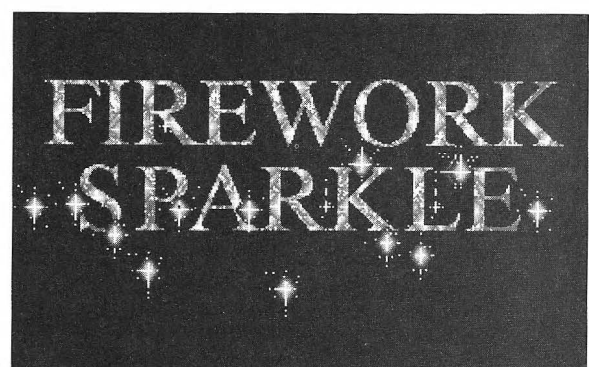
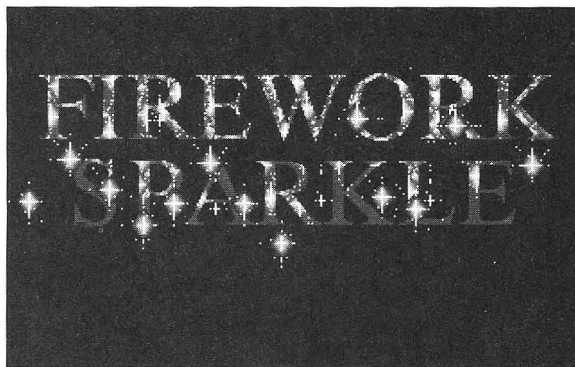
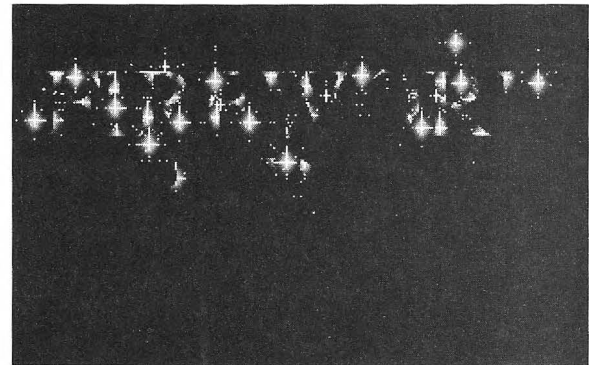
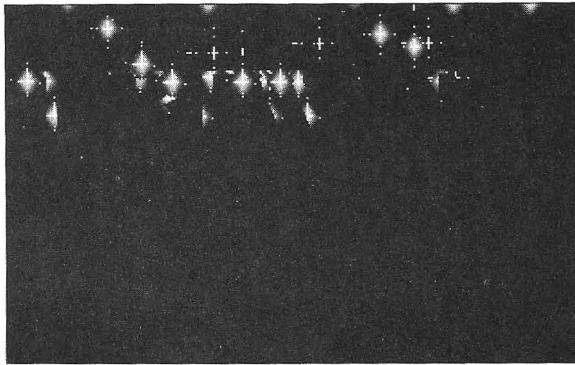
*Club Baltic Logo Writes On*

## Other Examples

The two examples in this section illustrate interesting effects that result from compositing or joining flics. The first example is from Jeri Johnston, who also contributed the butterfly in Chapter 12. The second example is a presentation from Keith Metzger of Amazing Media introducing the Amstrad personal computer (copyright Amstrad, Inc. 1990).

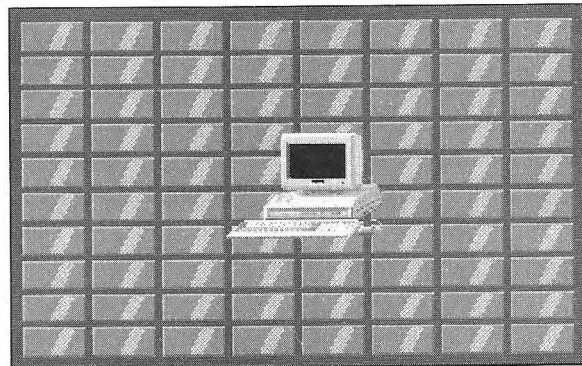
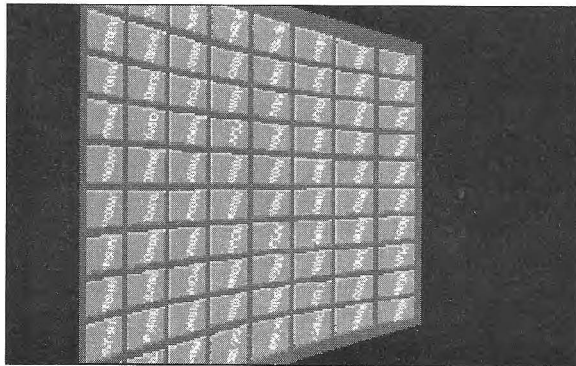
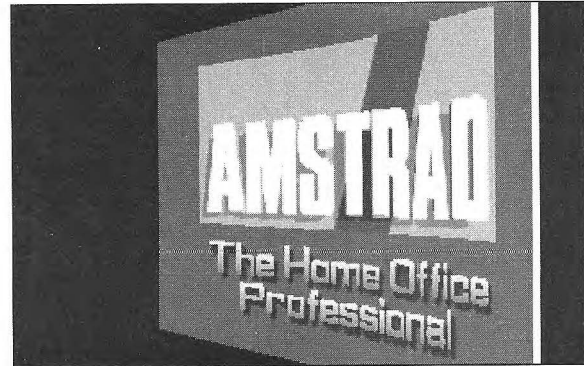
In Jeri Johnston's sophisticated, visually stylish title, shown below, sparkles cascade down the screen, gradually reveal the title, and then cover it up again. One flic of sparkles is composited under the title, and another is composited over the result.





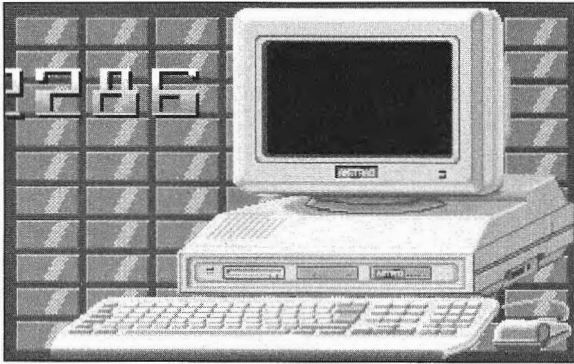
*Sparkling Prose*

The presentation for Amstrad computers composites a variety of fast-paced, visually striking elements. The scene flips vertically, the titles swing on, and the computer appears to surge forward from the background.



*From Amstrad Presentation*





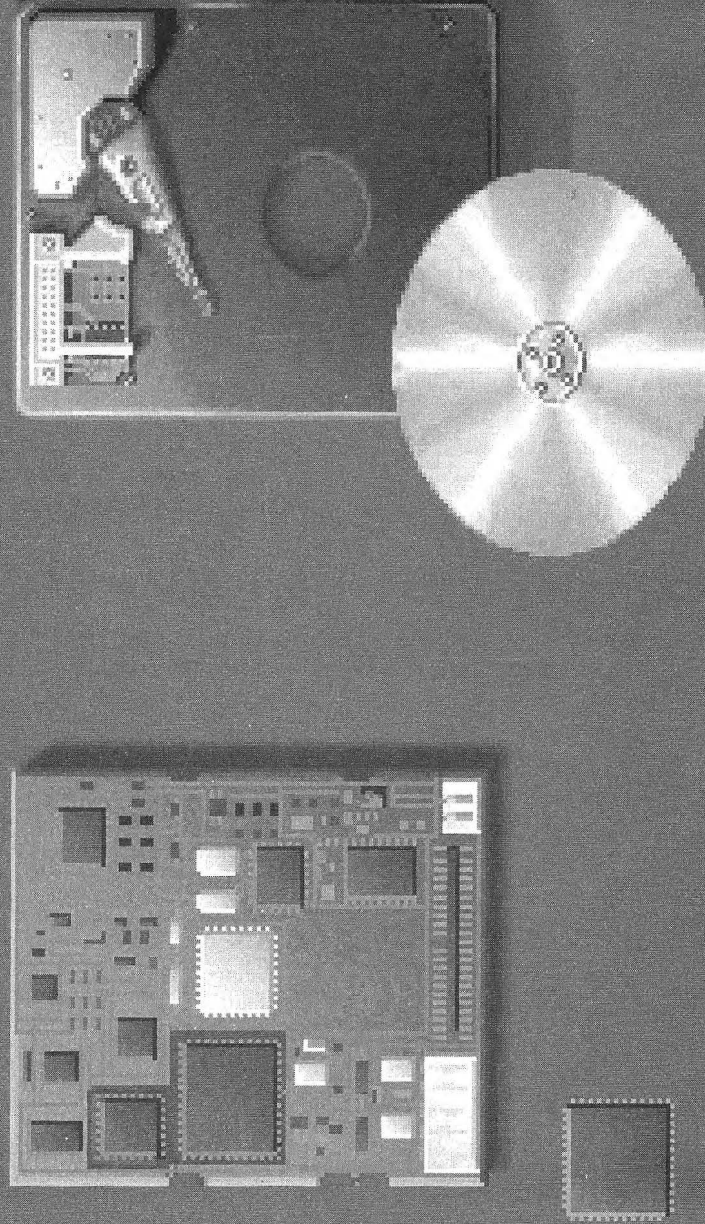
*From Amstrad Presentation*



### ***Next Steps***

Having put together the major parts of the Club Baltic animation, you'd probably like to be able to show it off. Chapter 14 will explain how you can do so and how you can make your own presentations. Chapter 14 also explains how to turn drawings from AutoCAD and AutoShade into Animator presentations.

## Western Digital designs and manufactures:



*From an Automated Presentation for Western Digital*

# Getting Presentable

From the beginning of this book, you've been encouraged to think about work you do with Animator as a project to be planned and then created. The moment finally arrives — ta-dah — after preparing the storyboard and layout, after making the drawings and movement sequences, after refining the timing, joining and compositing the parts, your project is finished. It's ready to be launched upon a waiting world.

This chapter shows you how to put together an automated presentation using Animator's Player program. Player presentations will run smoothly, with or without you, outside of Animator. For experienced AutoCAD users, there's also a section on using Flimaker, Animator, and Player to present 3D animations of wireframe AutoCAD slides or shaded AutoShade renderings.

## The Player Program

Once an animation project is done, your work can travel on disk to the client's conference room, a trade show, a stockholders' meeting, a seminar on adolescent creative urges, or your cousin's surprise birthday party. If you include the Player program (AAPLAY.EXE) on disk, along with your animation, any compatible system equipped with a VGA display can show it, and Animator need not be installed.

The Player program, which comes with Animator, is intended primarily to let you run Animator presentations on systems other than the one on which you created them. There are two ways to operate Player. One way is to start the program and then select from menus, click on frame control icons, or drag a play speed slider bar, all similar operations to their Animator counterparts (or you can substitute keystrokes on systems without a mouse). The other way is to write a *script*, a text file of instructions that Player uses to

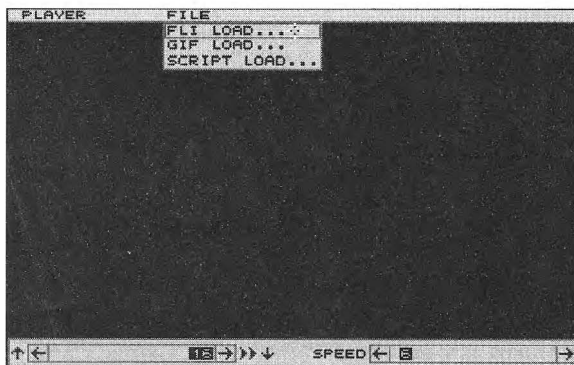
automatically load and play through the sequences that make up the presentation.

Both have their purposes. Using the Player menus to start and stop playback makes it possible to interject comments and adjust a presentation to a particular audience. Running Player from a script automates a presentation, so the person showing it needs no expertise in Player or Animator.

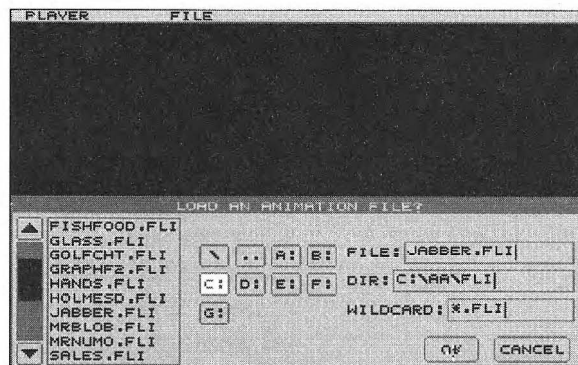
### ***Showing Animations From Within the Player Program***

You (or the person to whom you send the files) can select options in the Player program to play flics one at a time or to step through the frames, making the presentation somewhat flexible. This is handy when you want to allow audience response or to direct your audience's attention to a certain point, perhaps repeating a sequence for emphasis. You might choose, for example, to show an animated storyboard to a client from within Player so that you can linger over each sequence, replay it, and answer questions before going on. Or you might project a series of animated charts onto a large monitor, stopping to supply a verbal context for each one.

To show an Animator presentation from within the Player program, change to the directory in which the AAPLAY.EXE file is located, if necessary. Type AAPLAY at the DOS prompt, and press <enter>. When the Player screen appears, either press mouse buttons or keys on the keyboard to select items from menus, as you do in Animator.



*The Player Screen*



*Selecting a Flic in Player*

The menu bar contains two menus, **PLAYER** and **FILE**. The two items on the **PLAYER** menu are **ABOUT**, which identifies the version of the program, and **QUIT**, which ends it. The **FILE** menu contains options for displaying the file selector to load a flic, a picture, or a script. You can change drive and directory, just as you do when selecting files in Animator. After a flic is loaded, the frame control icons at the bottom left of the Player screen display individual frames, move forward or backward, or play through the flic. A slider bar at the bottom right of the Player screen enables on-the-spot adjustments to the play speed to compensate for speed differences in various machines.

**NOTE** *When sending a disk to someone else who is going to play your presentation, send instructions to install AAPLAY.EXE and the Animator files in the same directory on a hard disk. Then it won't be necessary to look through other drives or directories to find the Animator files.*

*The file AAPLAY.DOC, which documents the Player program's operation, must also be included on disk when you send the Player program and your animations to someone else.*

If the system is not equipped with a mouse, you can type the initial of the menu and then the initial of the item, just as you can for Animator menus. The keyboard alternatives for the frame control icons are the same as in Animator with one exception: the down arrow key displays the last frame of a flic rather than playing the animation through. In Player, the key that plays the flic is the <enter> key.

You can use the keyboard to load a file and to adjust play speed during playback. The plus key slows it down, the minus key speeds it up, the function keys select preset speeds, and pressing any key stops play, unless you lock the keyboard. See the Player appendix in the *Autodesk Animator Reference Manual* or the text file AAPLAY.DOC for more details.

### ***Showing Scripted Animations With Player***

The Player program automates presentations. Instead of starting the Player program and then selecting files from menus, you include the name of a Player script file on the DOS command line along with the AAPLAY command that starts Player. The Player script is a text file that contains the names of all the flic files to be played. The

presentation plays through, without interruption, from one flic to the next. Internal pauses incorporated into a flic in Animator, such as duplicate frames or holds, are maintained, and the default speed is the play speed set in Animator for each flic. You can, however, alter the play speed by specifying a speed *parameter* in the Player script, as explained in the next section.

It's simple to prepare a script file. In your word processing program or text editor, list the individual files that make up the presentation, typing each on a separate line in the order they are to be played. The script can contain pictures (GIF files) as well as flics (FLI files). The only limit to the number of files in a script is the space available on your hard disk.

If the file will not be in the current directory or drive when the Player program displays it, you must precede the filename with the directory path (and the drive, if needed). End each line by pressing <enter>. You can type in upper case, lower case, or a combination of upper and lower case. When the script is typed, save it as an ASCII file (ASCII is sometimes called text mode or programmer's mode, and some word processors refer to an ASCII file as a non-document file). If you are not familiar with ASCII files, you can prepare the file with the text tool in Animator and save it as a text file.

**TIP** *Write a script file of all the animations you want to transfer to videotape at once. This eliminates any slight delay on tape from the end of one file to the beginning of the next. For information about making presentations on videotape, see the appendixes.*

In the next exercise, you'll write a script that automatically plays the Club Baltic animation from the opening fantasy sequence through the guy blinking on the beach. The instructions assume the Player program is in the AA directory and the three animation files for the sequence, SUNFADE.FLI, FANTASY.FLI, and GUYSJOIN.FLI are in the \AA\IN subdirectory. If you don't have these files, you can substitute Animator sample files or other files you've made. Include file paths and drive letters as needed.

You'll use Animator's text tool and save the script file with an easily recognizable name, CLUB-01, in the \AA\IN directory. Animator will add the extension TXT. Then, you'll play the script.

## Writing a Player Script With the Text Tool

Reset Animator.

Use **TEXT** Set two corners of an editing box covering most of the screen.  
 Type \aa\in\sunfade.fli Press <enter>  
 Type \aa\in\fantasy.fli Press <enter>  
 Type \aa\in\guysjoin.fli Press <enter>  
 Right click **screen** Pastes text.

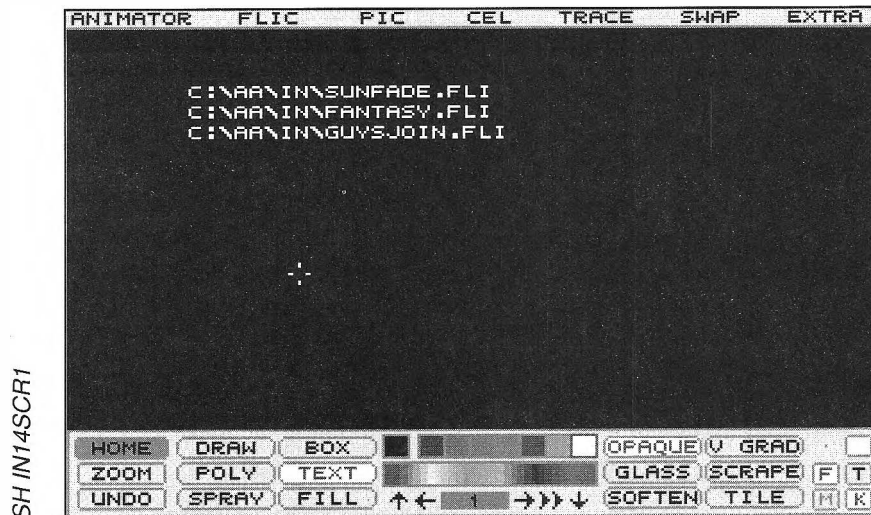
Right click **TEXT** Displays text options on drawing tools panel.  
 Click **SAVE** Displays file selector for saving ASCII text files.

Save the script file in the \AA\IN directory as CLUB-01.

Quit Animator, returning to DOS C:\> prompt in the root directory.

C:\> \aa\aaoplay \aa\in\club-01.txt <enter>

Each flic plays in succession, with no break between them. When the three flics have played through, the DOS prompt appears again.



Writing a Player Script

### ***Controlling Screen Flashes in Flics***

During playback, the screen may flash between flics or when the palette changes between frames. This should not be a problem with the Club Baltic flics because we planned the palettes to be consistent throughout. If you encounter such flashing in your own work, you can get rid of it by making sure all frames use a single palette. For flashing within a single flic, just select ONE PALETTE from the PALETTE menu.

There are two main techniques to get rid of flashing that occurs between flics. The first is to join them in Animator as a single flic and select ONE PALETTE. The section on *Creating a Single Palette* later in this chapter illustrates this technique. However, joining several flics to create one palette is impractical for large flics — you'll run out of disk space and time. The second (and preferable) technique is as follows:

- Load each flic and select ONE PALETTE on the PALETTE menu. Save one frame as a GIF picture file, but don't save the flic.
- Create a flic and load each of the GIF files into a separate frame.
- To ensure that each frame uses all colors from its original flic's palette: select GET CLUSTER from the palette menu and click on the first and last colors in the color matrix of each frame; use h grad ink with dither off and apply ink, thereby painting each frame with its palette. You'll then have a flic of palettes, one from each original flic.
- Select ONE PALETTE and save the resulting palette as a COL file.
- Finally, for each original flic: load each flic; turn on the [T] button; load the palette COL file and answer YES to the color fit screen question; then render and save the flic.

Either technique will impose a single palette on all the frames of the flics, but may change some colors, so check to be sure that the results match your artistic intent.

### ***Setting Parameters in Scripts***

You can include instructions in a script for changing a sequence's play speed, adding a hold at the end of a file, replaying a file a specified number of times, and making a transitional fade in or fade out from



a white screen. These instructions, which affect individual files, are called *parameters*. There are four of them:

- **-S <nnn>** is the speed parameter. It sets the play speed for an individual flic, if you want it to be different from the play speed at which you saved it in Animator. You can specify a number from 0 to 120, the same range as the play speed slider in Animator.
- **-P <nnn>** is the pause parameter. It sets the number of seconds for a pause while the last frame of a flic or the picture is held on screen; the limit is 14,400 seconds or four hours. Pressing any key during a pause resumes play.
- **-L <nnn>** is the loop parameter. It sets the number of times an individual file is replayed, up to 999 times, before the next file is played.
- **-T <fadein> <fadeout> <cut>** is the transition parameter. It sets either a fade in from a white screen at the beginning of an individual flic, a fade out to a white screen at the end of the flic, or both a fade in and a fade out, according to your specifications.

**NOTE** *If you set no parameters in the script, each file is played at the speed you saved it in Animator. No holds are added except for those you created with duplicate frames in Animator, no files are replayed, and all transitions are straight cuts (except for the transitional effects within flics that you created in Animator).*

To include a parameter, type a space after the filename, a hyphen, the initial of the parameter, and the setting. You can add one or more parameters to each file, each parameter separated by a space. For example, the script line

```
\aa\in\beach01.fli -s15 -t fadein fadeout <enter>
```

would specify for the file BEACH01.FLI a play speed of 15, a transitional fade in from a white screen at the beginning, and a fade out to a white screen at the end of the flic.

In the following exercise, you'll alter the script to change the play speed of SUNFADE.FLI and add a pause at the end of FANTASY.FLI.

---

## Adding Parameters to a Script

Start Animator again and clear the screen.

Right click **TEXT**

Click **EDIT**

Displays text still in text buffer. (If the text buffer has been cleared, load the CLUB-01.TXT file.)

Move cursor to end of first line.

Press <spacebar> Type **-s15**

Sets play speed for SUNFADE.FLI to 15.

Move cursor to end of second line.

Press <spacebar> Type **-p20**

Sets a 20 second hold at end of FANTASY.FLI.

Right click **screen**

Returns to text options.

Save the updated file as CLUB-02.FLI in the \AA\IN directory.

Quit Animator and return to the root directory.

C:\> \aa\aplay \aa\in\club-02.txt <enter>

---

**NOTE** *Setting parameters in a script file does not alter the Animator file itself. If you were to play the SUNFADE.FLI file in Animator, it would be set for the speed at which you created it, not for the speed specified in the script file.*

There are ways you can reduce the size of Animator files by using Player scripts. Cycles are good candidates for the loop parameter in Player. For example, you can make a separate flic of just the last nine frames of BEACH02.FLI, which is a complete cycle of the exercisers, and repeat the flic with the loop parameter whenever the exercisers are onscreen by themselves. And instead of adding numerous still frames to hold a title on screen, as you did at the end of Chapter 7 with the "Trusses Are Us" title, you can make a flic of just one frame that displays the title and add a hold with the Player's pause parameter for as many seconds as you like.

There are also options for looping more than one file in a script, for linking script files to run without interruption, and for exiting to the Player program screen rather than to the DOS prompt and vice versa. These are covered in detail in the *Autodesk Animator Reference Manual*.

**TIP** *Pressing any key during playback stops the current flic or loop, causing the next script instruction to be executed. To start and stop your presentation at will from a script, loop flics with very long pauses between them and press any key during a loop or a pause.*

### ***Writing the Complete Script for Club Baltic***

If you've finished the Club Baltic animation — or if you solemnly intend to do so — you'll probably want to show it with the Player program so that the flics can run uninterruptedly. The following script shows you how to do this. Even if you've only completed part of the animation, you can try the script with the flics you have, omitting the lines for the flics you're missing.

Running the animation with the Player program allows you to reduce the size of the LOGO1.FLI flic. At the beginning of that flic, you added duplicate frames to hold the scene of the couple on the beach at twilight a moment or two before the scene begins to flip up. You can now make a one-frame flic of that scene, insert it in the Player script just before LOGO1.FLI, and add a pause parameter setting of several seconds at that point. In the script below, that flic is named TWILIGHT.FLI. You would, of course, then delete the duplicate frames in LOGO1.FLI, resulting in a smaller file which contains only the flipping title sequence.

You can also reduce the size of the final flic, LOGOEND.FLI, which is the cycle of the starfish exercising beneath the Club Baltic logo. The cycle is only three frames long, and that's enough when you run it with Player. To repeat the cycle eight times, you can cut the flic down to its first three frames and add a loop parameter setting of 8 in the Player script, as shown below.

The Player option to loop more than one flic is also used in this script. The last line is an instruction to loop the entire preceding list of flics 999 times, or, in effect, until someone interrupts playback by pressing <escape>.

To try this script, modify the CLUB-02.TXT script and save it again with the same name.

```
C:\AA\IN\SUNFADE.FLI -S15 -P2
C:\AA\IN\FANTASY.FLI -P3
C:\AA\IN\GUYSJOIN.FLI
C:\AA\IN\BEACH01.FLI
C:\AA\IN\BEACHTEN.FLI
C:\AA\IN\BEACHFSH.FLI
C:\AA\IN\WINDSURF.FLI
C:\AA\IN\TWILIGHT.FLI -P3
C:\AA\IN\LOGO1.FLI
C:\AA\IN\LOGOEND.FLI -L8
LOOP 999
```

Once you've run the Player script, experiment with other settings because the timing on your system will probably vary from ours.

## **Making the AutoCAD Connection**

If you are an experienced AutoCAD user, you will probably want to take advantage of its 3D capabilities. Your 3D models can be the basis for exciting animations, creating the impression that seemingly solid objects spin and turn or that the viewer is flying through and around a model. As you know, Animator is not a 3D program. It cannot calculate the inbetween positions for three-dimensional objects moving within a three-dimensional coordinate system. But you can create all the positions for a 3D animation either as AutoCAD wireframe models or as AutoShade renderings. The Flimaker utility supplied with Animator can convert batches of AutoShade rendering files (RND) as well as slide files (SLD) from AutoCAD, AutoSketch, and AutoShade into flic files (FLI) to bring into Animator. In Animator, you can apply movements and image processing to the files and then present them automatically with Player.

This section describes how to start out in AutoCAD and end up with an automated presentation. Those proficient in AutoCAD and AutoShade may want to try the exercises, which remake a variation of the truss flic from Chapter 7 with true 3D models and camera motion. To do the exercises, you'll need AutoCAD Release 10 (or higher) and Flimaker. To make a shaded version, you need AutoShade 1.1 (or higher).

In addition, you should have the Animation Tool Kit (ATK) program. Preparing the frames for animated 3D models in AutoCAD can be tedious and laborious, but there are programs that automate some of the steps. One is Animation Tool Kit from Autodesk, which automates the process of making the slides or renderings and writes the list of frames Flimaker requires for batch conversions.

**NOTE** *The Animation Tool Kit will be included with AutoShade 2.0. You can also obtain the ATK from any Autodesk dealer or you can download it with a modem from the ADESK forum on CompuServe.*

### ***Creating AutoCAD Slides for Animator***

For wireframe animations, you start with a 3D AutoCAD drawing of your objects. From this drawing, you need to make one slide per AutoCAD view for each frame in the animation, using AutoCAD's MSLIDE command. To give the impression that change is occurring from one frame to the next, you can change the viewpoint, move objects, or both. To create smooth, precise animation, you can use 3D polylines to describe the paths you want the objects or viewpoint to follow. Using the MEASURE command, you can place a series of points on each polyline. Then you can compose each slide by using these points to move objects or locate viewpoints.

**TIP** *Be sure to give each slide a unique filename. An easy way to do this is to use several of the possible eight characters to describe the animation or relate it to the drawing file, and use the remaining characters to number each slide sequentially. For example, slides for an animation from a drawing named WIDGET could be named WIDGET01, WIDGET02, WIDGET03, and so on.*

When the slides are ready, you create an animation list for Flimaker. This is simply a list of the slide or rendering files for Flimaker to process in batches and compile into one flic. Using your text editor or word processor, list each slide's filename on a separate line, and enter a final carriage return on the last line. Save the file as an ASCII text file. An animation list of four slides to animate a drawing named WIDGET might look like this:

```
WIDGET01  
WIDGET02  
WIDGET03  
WIDGET04
```

The final step is to run Flimaker. The slides in the animation list are then converted into frames and compiled into a flic you can bring into Animator. See *Making a Flic With Flimaker*, later in this chapter.

If you have the Animation Tool Kit, you can create the slides and the animation list automatically once you've drawn the model. The exercises later in this chapter show you how to do this.

**NOTE** *Don't use wide filled polylines or 3D entities produced by the AutoCAD SOLID command for Flimaker slide presentations. Flimaker can't process solid filled areas or wide filled polylines.*

### ***Creating Rendering Files for Shaded 3D Animations***

Frames for shaded 3D animations are a bit more complicated to create in AutoCAD than wireframe slides. Objects for rendering must be created in AutoCAD with opaque 3D entities to give the appearance of surfaces, and this procedure takes longer than drawing simple 3D lines. And you have the additional steps in AutoCAD of positioning lighting and cameras for the animation, creating scenes, and producing filmroll files. Then you have to process each filmroll file in AutoShade to create the rendering files for Flimaker.

If your animation will have a fixed viewpoint — that is, if you won't be creating the illusion of walking or flying around the scene — you need only place one camera and create one scene for the entire animation. You can move objects incrementally between filmrolls and your finished animation will show objects that seem to be in motion (kinetic motion).

If, on the other hand, you want the viewpoint to change during the animation, you must either create one scene and filmroll for each frame of the animation that has a different camera position, or produce one filmroll file of a single scene and create an AutoShade script file to move the camera and/or target points in AutoShade. The method you use depends on how complex you want the viewpoint movement to be, and how comfortable you are making geometric calculations and writing AutoShade scripts. Fortunately, the ATK will handle most of this for you, so you can concentrate on what to animate, not how to do it.

Then you configure AutoShade to output files in VGA resolution (compatible with Flimaker and Animator) and render the frames in AutoShade, as the exercises in this chapter demonstrate. When AutoShade has finished, you should have a rendering file (RND) for each frame in your animation sequence.

**NOTE** *You can run AutoShade in batch mode to process groups of filmrolls quickly. For more information on running AutoShade scripts and batch processes, consult your AutoShade User Guide. Generally speaking, anything you can do with AutoCAD and AutoShade to change geometry, viewpoints, and lighting, you can use with Flimaker to create flics for Animator.*

## Creating Frames for Animator With the Animation Tool Kit

The Animation Tool Kit is a group of AutoLISP routines that automate making the slides, filmrolls, script, and animation list to bring 3D frames from AutoCAD into Animator. Using the ATK, you can place multiple drawing entities in motion, simulate entity transformations by manipulating blocks, create batches of slides from different viewpoints along polyline paths, and animate camera motion along polyline paths.

**NOTE** *The AutoLISP routines supplement or replace the ones supplied for AutoShade and replace the AFWALK and AFKINET routines that are used for AutoFlix.*

The following exercises show you how to use AutoCAD, the ATK, AutoShade, Flimaker and Player to remake the truss flic from Chapter 7. In this version of the truss, the camera or the viewpoint will pan around a cube in a wide arc from a slight angle above it. At the same time, a true 3D truss assembly will drop down and come to rest on the top edge of the cube. The panning demonstrates the camera movement on a path and the moving truss demonstrates the kinetic entity animation capabilities of the Animation Tool Kit.

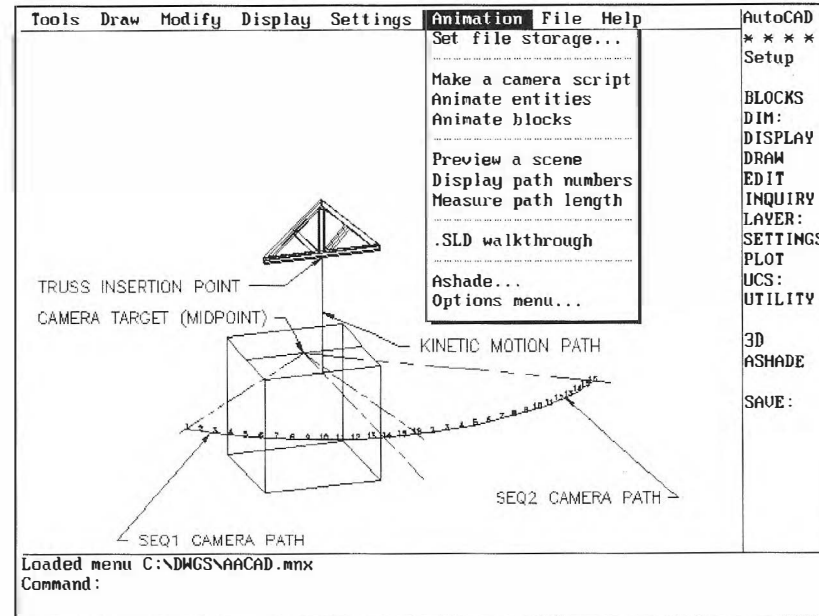
To make the flic more interesting, you'll continue to pan around the scene to display its 3D qualities after the truss comes to rest on the cube. To accomplish this, you'll build the flic in two sequences, one with simultaneous panning and kinetic motion of the truss, and a second sequence of equal length that continues the camera pan from

the end of the first sequence. Later, you'll make one smoothly running flic in Animator.

### ***Building the Truss Drawing in AutoCAD***

To begin, you need to create the truss scene and its animation motion paths as a 3D AutoCAD drawing. If you have the IN DISK, you already have the completed IN14TRUS.DWG file. Otherwise, we assume you know AutoCAD and you are familiar with 3D construction techniques. The dimensions and placement of elements are not critical — you'll get approximately the same results with minor deviations. If you have AutoCAD but not AutoShade, you can use the ATK to produce a series of slide files for Flimaker; either draw 3DFace entities as instructed below, substitute 3D lines for the truss, or use the CUBE command (from 3D.LSP supplied with AutoCAD) for the cube.

Choose complementary colors to distinguish the truss from the cube. You'll make the truss a block so it'll be easy to select when you animate it.



***AutoCAD Truss Drawing***



---

### Setting Up the Truss Drawing



Start AutoCAD, load the IN14TRUS drawing file, and skip this exercise.



Start AutoCAD and create the new TRUSS drawing as illustrated.

Draw a 6" cube made of 3DFace entities.

Draw a truss 6" wide by 3" high in a complementary color, with .5" x .5" square members built out of 3DFaces. Make the truss a block with its insertion point at the midpoint of its bottom face.

Insert the truss upright and aligned with the top front edge of the cube as shown in the illustration. Then raise it 6" above the cube (to 12" elevation in the Z axis).

---

Next you'll draw the motion paths that the ATK will use to calculate the truss and camera positions. The kinetic motion path is a 3D polyline extending from the truss block's insertion point to the midpoint of the cube's top front edge. This will be the motion path for the truss to follow. The ATK routine will use it to calculate the incremental distance to move the truss in each frame. The second line is not a path, but you'll need to use its midpoint as the target point to aim the camera and as the center point of the arc for the camera's motion path. Then you'll draw the camera paths as an arc, which you'll convert to a polyline and break in two. This will result in two camera paths, one for each sequence. The two camera paths will later be rejoined into one continuous, smooth motion in Animator.

---

### Drawing the Motion Paths



Skip this exercise.



Do this exercise.

Make a new current PATHS layer and use a third color for the following.

Draw a 3D polyline from the truss block's insertion point to the midpoint of the cube's top front edge.

Draw a line parallel to the truss from the midpoint of one side edge of the cube to the other.

Using the midpoint of the line just drawn as a center point, draw a 90 degree arc (one quadrant of a circle) with radius 18" and elevation 8" (2" above the cube). Center the arc on the front face of the cube.

Convert the arc into a polyline with the PEDIT command.

Divide the polyline arc into two equal segments with the BREAK command.

Save your work as TRUSS.DWG with a 3D viewpoint similar to that illustrated.

---

**TIP** *AutoShade may refuse to process a script if there is nothing visible in the first few frames. This can occur if you are trying to "fly" in on a scene but the camera cannot yet "see" anything visible within its field of view. To give AutoShade something to "see" and to make the animation more interesting, you can add extra scenery or create a large 3DFace, grid, or other background for AutoShade to see and process.*

Now that your drawing is ready, you can process it with the ATK.

### ***The Animation Tool Kit Menu***

The ATK comes with its own menu, AACAD.MNU, which duplicates the standard ACAD menu, and adds a new Animation... selection on the Options pull-down menu. When you select Animation..., an animation menu replaces the Options pull-down menu. This new menu provides selections for the ATK's programs. Each of the ATK menu selections is described in the table below.

<b>Animation Tool Kit Menu</b>	
<b>ATK Menu Item</b>	<b>Function</b>
Set file storage	Inserts invisible attribute block in drawing at 0,0 that holds a directory path for placing ATK-generated files.
Make a camera script	Generates AutoShade filmrolls and script, Flimaker animation list.
Animate entities	Produces kinetic animation filmroll, slides, or blocks to move and rotate entities.
Animate blocks	Moves blocks along paths and/or simulates scalar transformations.
Preview a scene	Displays in AutoCAD the view from a particular frame.
Display path numbers	Annotates motion paths with frame number as aid in determining their order and for selecting a frame to preview. Numbers are invisible in AutoShade, but appear in slides unless the layer PATH_NUMBERS is turned off.
Measure path length	Measures length of polyline path.
.SLD walkthrough	Produces slide files from an existing camera script, useful to prototype quickly how finished animation will look.
Ashade. . .	Duplicates Ashade option from Options menu.
Options menu. . .	Returns you to Options menu.

The first three items are the most often used, and the ones you'll work with next.

### ***Making the First Sequence***

Now you're ready to construct the first sequence of the truss animation in which the camera follows a path while the truss lowers into place. This sequence requires two procedures. First you select Animate entities from the ATK menu, which runs KINETIC.LSP to record the truss' kinetic motion as filmrolls. Then you select Make a Camera Script from the same menu to combine the camera motion around the cube and truss with the filmrolls you just created.

We assume you've installed the ATK files in a directory where AutoCAD can find them.

**NOTE** *These exercises were prepared with a preliminary version of the ATK, so you may see slight changes in the order of instructions. Since the prompts may change, we simply give major instructions in the following exercises. Wherever the exercises do not give specific instructions, accept the default with <enter>.*

When you enter the output type, KINETIC.LSP creates a filmroll or slide file for each frame. Alternatively, you can set the output format to Test and preview the motion to verify its correctness before making slide or filmroll files. While the routine runs, your truss should inch its way down the polyline path until it rests on the edge of the cube. A separate filmroll file for each frame will be written to disk.

**NOTE** *If you select slide output, camera and kinetic motion paths may be visible in front of the camera against the slide's background. You can temporarily remove them when given the option by the ATK. You can also use different layers to control the visibility of paths when using slide output.*

---

## Animating the Kinetic Truss

Start AutoCAD, load TRUSS.DWG and load the AACAD menu.

Select Animation... from the Options pull-down menu.

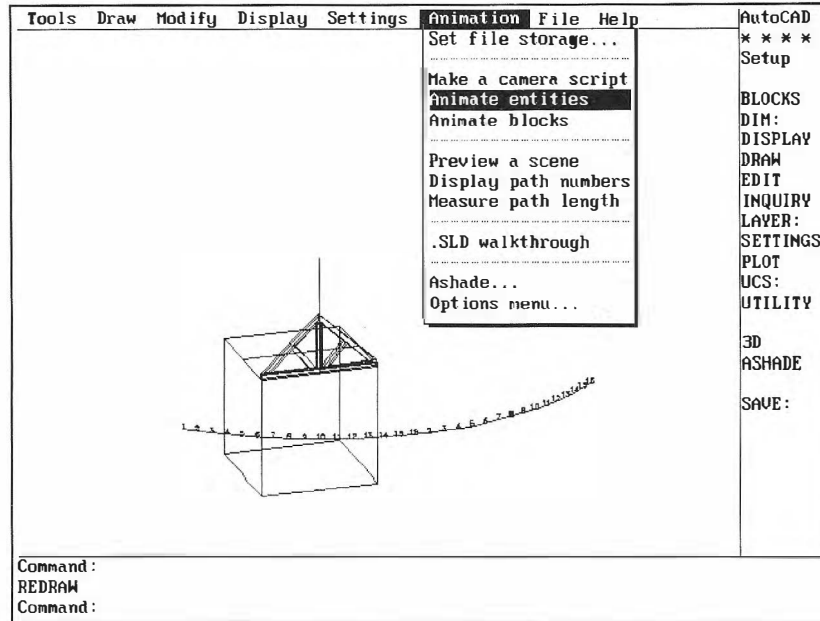
Select Set file storage... and enter the directory path where you have your AutoShade program, or \AA \IN if you're only creating slides.

Select Animate entities, enter SEQ1 as the name for the files to be created, enter 16 as the number of frames, and default the rest.

Pick the truss block as the object to animate and the vertical polyline as the motion path.

Accept the default rotation. Then press <enter> at the next object selection prompt to exit object selection and generate filmroll or slide files.

---



*AutoCAD Truss Drawing After Kinetic Motion*

**TIP** Use a small number of frames at first until you are sure you have everything right; 16 was enough for our example. The resulting flic lets you judge how many frames you'll actually need. Then you can remake the flic with as many frames as necessary.

Next you'll select Make a camera script. It runs PATH.LSP, which builds an AutoShade script to perform the camera and target point manipulations, and makes an animation list for Flimaker. This step sets up different viewpoints for the filmroll files you created above.

When prompted for names in this exercise, respond with SEQ1 as above. This will help you to recognize the files associated with this sequence and tell ATK to use the same filmroll filenames it created earlier. Answer yes to the kinetic animation prompt since this sequence contains the previous kinetic motion.

The ATK will incorporate your filmrolls into the script and animation list it produces. You can set up scenes and lighting with the ASHADE.LSP commands or let the lighting follow the camera by taking the defaults and omitting scene information, as shown in the exercise. Camera lens length can be fixed for the entire animation,

zoomed with each frame, or twisted to create interesting effects. A fixed lens length of 40 works best for this example.

---

### **Panning Around the Truss and Cube**

Select **Make** a camera script from the pull-down menu.

Enter SEQ1 as the camera script name. Answer yes to the kinetic animation prompt and enter 16 as the number of filmroll files (frames). Accept the default choices for the other prompts and enter SEQ1 as the name of the filmroll title.

Select the left half of your polyline arc for the camera path and specify the midpoint of the line across the top of the cube as the camera look-at target point, taking care not to select other objects.

Default the scene information and enter 40 as the camera lens length. Accept the AutoShade defaults for Twist and Intersection, and select Hard Copy, not Record.

Readers without AutoShade can select Slide for the shade type. Otherwise, choose Full or Fast, depending on the amount of time you want to wait for your model to process.

You'll see a message that slides, or an AutoShade script, SEQ1.SCR, and an animation list file, SEQ1.MVI, have been created.

Save the drawing as TRUSS2.

---

This completes the AutoCAD preparation of the animation's first sequence. You'll go on to do the second sequence, which pans on around the cube and truss without any kinetic motion in an equal number of frames.

---

### **Making the Second Sequence**

In AutoCAD, make sure the TRUSS2 drawing is loaded and that the truss is sitting on the cube.

Select **Make** a camera script from the pull-down menu. Enter SEQ2 when prompted for the animation and filmroll names and answer no to the kinetic prompt. Enter 16 as the number of frames.

Select the other half of the camera path arc for this sequence, and specify the same line midpoint as before for the look-at target so that the view direction will be the same.

Specify the same lens length of 40, the Hard Copy option, and shade type or slides. Answer yes to create one filmroll file when prompted.

You'll see a message that slides, or a filmroll and an AutoShade script, SEQ2.SCR, and an animation list file, SEQ2.MVI, have been created.

If you will be doing a wireframe animation *without* AutoShade, end your AutoCAD drawing and skip to the section Making a Flic with Flimaker. Otherwise, end your AutoCAD drawing and prepare to create rendering files from your filmrolls in AutoShade.

---

In about 15 minutes, you've produced what would have taken about four hours without the ATK. And the ATK saves even more time in rendering the images in AutoShade.

## Rendering the Frames in AutoShade

In this section, you'll use AutoShade to render the files for the 3D truss animation. First, you'll set up AutoShade to render the files in the correct format for Flimaker and Animator. Then you'll start AutoShade and process the script file SEQ1.SCR. It will load all the filmrolls created in the first sequence and render each one with AutoShade's Hard Copy option, setting camera and target points along the path you selected. It will produce one rendering file (RND) for each frame. These files are already listed in the SEQ1.MVI animation list for Flimaker. You'll do the same with SEQ2.SCR. This script will load the SEQ2.FLM filmroll produced in the second sequence and create the rendering files which are already listed in the SEQ2.MVI animation list.

### *Rendering in the Correct File Format*

Because Animator and Flimaker work only with images in 320 x 200, 256-color format, AutoShade must create files in that format whether or not it matches the resolution and color capabilities of your rendering display device or hard copy output device. Setting the SHADERDFILE environment variable before running AutoShade will create rendering files in the correct format when you select Hard Copy. Setting the SHADERDFILE environment variable does not

affect your AutoShade rendering screen display resolution or any rendering files created by selecting the Record option.

**NOTE** *You can create AutoShade rendering files by selecting either the Record or Hard Copy option. We'll select Hard Copy, but if you later want to use Record and you have a VGA display adapter capable of running Animator, you can reconfigure AutoShade for the 320 x 200, 256-color RDVGA.EXE ADI rendering display driver supplied with AutoShade 1.1 or later. See the AutoShade Installation and Performance Guide for details.*

You will also need to reconfigure AutoShade to create 256-color rendering files before selecting the Hard Copy option, as in the following exercise. For safety, you'll make a backup copy of your existing AutoShade configuration at the beginning of the exercise and restore it when through.

### ***Processing the Scripts in AutoShade***

Now you can render the two animation sequences in AutoShade. You should be in the directory where AutoShade is installed. Because you specified the Hard Copy option for the AutoShade script written by the Animation Tool Kit, all you need do in AutoShade is load the script for each sequence.

---

### **Processing the Scripts in AutoShade**

Type **copy shade.cfg shade.old**      Copies your AutoShade configuration for safekeeping.  
Type **set SHADERDFILE 320,200,10000,13100,256,63,64**      Sets the SHADERDFILE environment variable for AutoShade.  
Type **shade -r**      Displays AutoShade configuration menus.

After selecting your pointing device and display device, select the ADI rendering device if you'll be using RDVGA.EXE with Record.

For the hard copy device, select the rendering file option with 256-color map.

When the AutoShade screen appears, select SCRIPT from the FILES pull-down menu and load the SEQ1 script. AutoShade processes the script and produces the rendering files for the first sequence.

Select SCRIPT again and load the SEQ2 script. AutoShade processes and produces the rendering files for the second sequence.

Quit AutoShade.

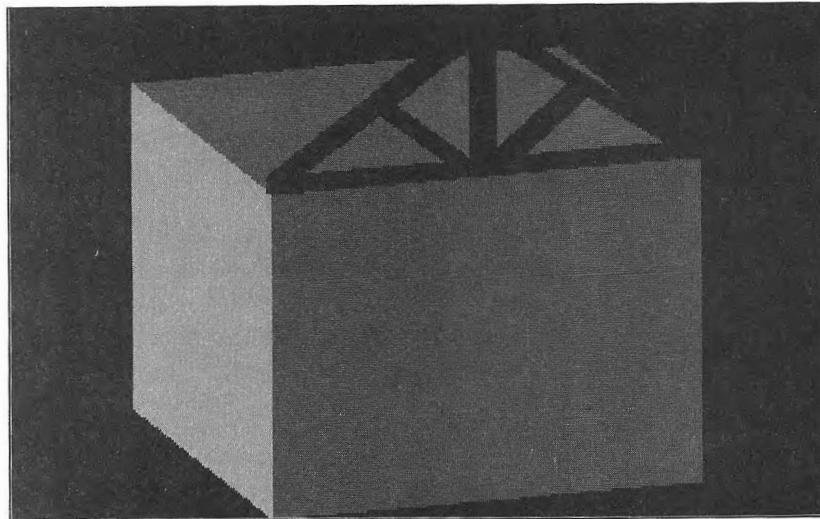


If you need to restore your previous AutoShade configuration, delete SHADE.CFG and rename SHADE.OLD to SHADE.CFG.

---

You now have a set of rendering (RND) files for Flimaker to process. The renderings were not displayed as they were produced because you used the hard copy option to write them to files. Although the AutoShade rendering process may take hours to produce the renderings for long sequences of complex 3D models, it is fully automatic so you can run it overnight.

**NOTE** *Even if you aren't using the ATK, you will still need to set the SHADERDFILE environment setting or configure AutoShade for the RDVGA.EXE ADI driver whenever you create AutoShade rendering files for Flimaker. If you need to use a different SHADERDFILE variable for other reasons, you may want to create a separate batch file for each configuration. This allows you to apply the appropriate settings when you are working with Flimaker and switch the configuration for other programs.*



SEQ1 Frame Rendered in AutoShade

The final step before you can bring the frames into Animator is to convert all the rendering or slide files into flics with Flimaker. The process is detailed in the following section.

## Making a Flic With Flimaker

To convert rendering or slide files into a flic, you should have the animation list and the rendering or slide files all in the same directory. Then you change to that directory and run Flimaker from the DOS prompt. Include the name of the animation list, the name you want for the flic, and any options you want to use, along with the FLIMAKER command, on the DOS command line.

For example, to process the animation list SEQ1.MVI in Flimaker, converting its rendering files to a flic called SEQ1.FLI, you would enter:

```
flimaker seq1.mvi seq1 <enter>
```

The Animation Tool Kit adds the extension MVI to the animation list it writes. Flimaker automatically adds the extension FLI to the flic it creates, so you need not include the extension in the flic name you type on the command line. After the conversion is completed, a message appears, giving you the number of frames in the new flic, SEQ1.FLI.

**NOTE** *Flimaker 1.01 is available (from Autodesk, your dealer, or the ADESK forum on CompuServe) and should be used instead of Flimaker 1.0 if at all possible. Among other improvements, this version allows single RND or SLD files to be processed by Flimaker, and no longer requires a math coprocessor.*

You can add several options to the command line before running Flimaker:

- -V (View) preceding the animation list causes Flimaker to display each frame as it converts it.
- -C (Color map) preceding the animation list causes Flimaker to calculate one common palette for use across all frames created from the rendering files you are converting.
- <nn> (a play speed number from 0 to 70) after the flic name sets a play speed for the flic other than the default of 4.

For more information on Flimaker, refer to the appendixes of the *Autodesk Animator Reference Manual*.

In the next exercise, you'll first copy all the slide or rendering files and the animation lists into the \AA\IN directory. Then you'll convert the rendering files in SEQ1.MVI to the flic SEQ1.FLI and perform the same operation on the rendering files in SEQ2.MVI. You'll include the view option to display the files as they are processed, the color option to make one palette for each flic, and set the speed option to change the play speed to 10. It is assumed that you have Flimaker installed in the AA directory.

---

### Converting the Rendered Files in Flimaker

C:\> **cd \aa\in**                      Changes to the \AA\IN directory.

Copy all the files created by the ATK into the \AA\IN directory. You can use the \*.\* wildcard for all filenames.

C:\> **\aa\flimaker -v -c seq1.mvi seq1 10 <enter>**      Processes the batch of files for the first sequence.

Each of the first 16 renderings from AutoShade appears onscreen briefly in order and a message at the end confirms the flic SEQ1.FLI is successfully created.

C:\> **\aa\flimaker -v -c seq2.mvi seq2 10 <enter>**

Each of the files from the second sequence appears while it's being rendered and the message declares that the flic SEQ2.FLI has been successfully created.

---

That's all there is to converting rendering files in Flimaker. The two flics are ready to be joined and processed in Animator.

**NOTE** *If you're familiar with creating MOV files with AutoFlix (Autodesk's shareware EGA animation product), you'll find creating slide files or rendering files for Flimaker is similar. In fact, you can recycle slide files created for AutoFlix through Flimaker by simply making animation lists of the original SLD files. But you can't reuse rendering files created for AutoFlix. If you still have the filmrolls, you can reprocess them with the 256-color, 320 x 200 resolution in AutoShade. The animation command files for AutoFlix that end with MVI are not the same as the animation lists the ATK creates for Flimaker with the MVI file extension. Be sure to use different filenames to distinguish*

*between the two types if you plan to make animations with existing AutoFlix files.*

## **Polishing 3D Animations in Animator**

When you've prepared all the frames for a 3D animation and Flimaker has compiled them into a flic, you can load the flic into Animator and play it. At this point, you might change colors with the separate tool, apply soften or unzag ink, edge or emboss objects, or do any other image processing you find appropriate. You could also apply optics effects to the entire flic or to segments of it, composite titles onto it, or join it to other flics with transitions. In short, you have all the resources of Animator to polish the flic.

### ***Creating a Single Palette***

After joining two flics with different palettes, you should select ONE PALETTE on the PALETTE menu. Like Flimaker's -C option, ONE PALETTE creates a single palette for all the frames of the joined flic. Otherwise, you'll notice a flashing on the screen between frames where the palette changes.

The following exercise shows you how to polish the 3D truss animation in Animator so that it can be played automatically in Player. You'll load the first sequence, SEQ1.FLI and join the second sequence, SEQ2.FLI at its end with no transition, naming the newly joined flic, TRUSS3D.FLI. Then you'll make one palette for the joined flic, to eliminate the flashing you'll see between frame 16 and frame 17 when you play TRUSS3D.FLI.

**NOTE** *Although Flimaker made one palette for SEQ1.FLI and one palette for SEQ2.FLI, they do not share the same palette. Flimaker's color mapping has placed the same colors in different register slots in the two flics. You can see this if, before creating the single palette in Animator, you look at the color matrix on frame 1 (from SEQ1.FLI) and on frame 17 (from SEQ2.FLI) to see where the main truss color is.*

Once the palette is harmonized, you can put any finishing touches you like on the flic. The exercise suggests changing the default black background to a pleasant yellowish beige or some other color to set off the objects.

---

### Polishing the 3D Truss

Load SEQ1.FLI from your \AA\IN directory.

Join SEQ2.FLI at the end of SEQ 1.FLI with CUT.

Play the joined flic and notice the flashing between frames 16 and 17.

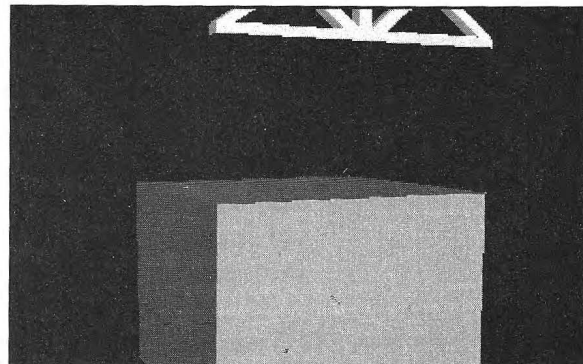
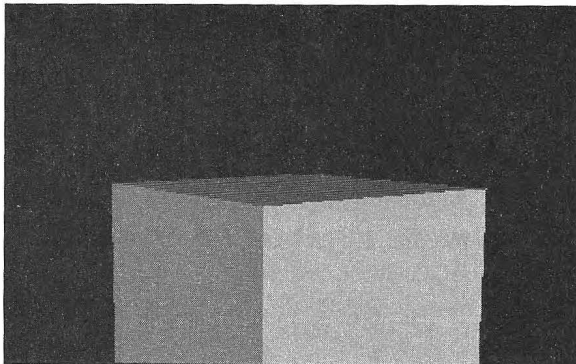
Type @ Displays palette.

Open **PALETTE** Select **ONE PALETTE** Changes to same palette for all frames, leaving most of palette black.

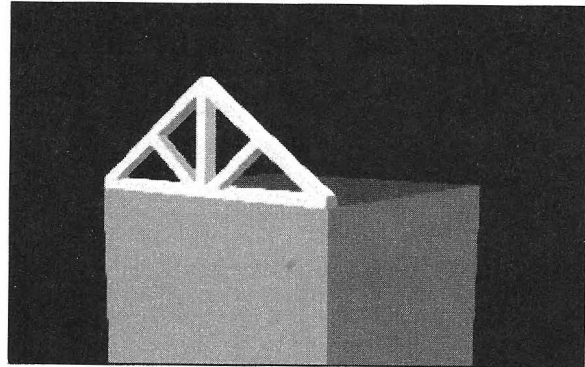
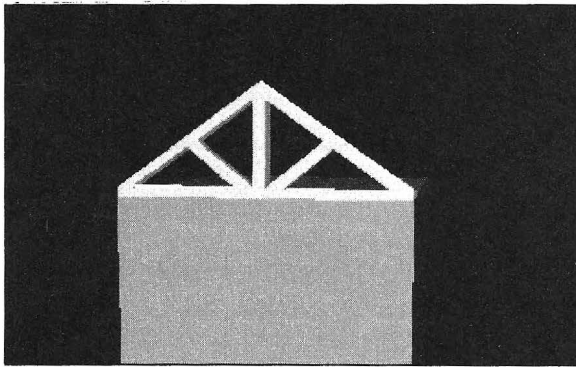
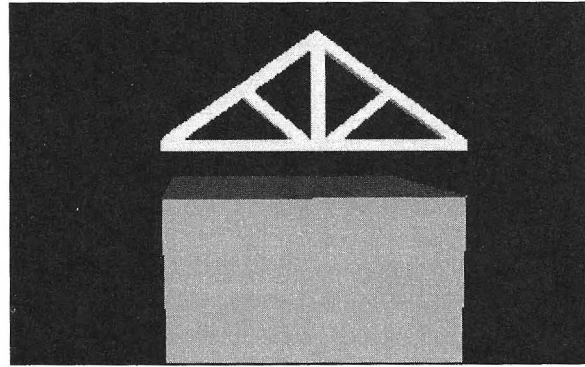
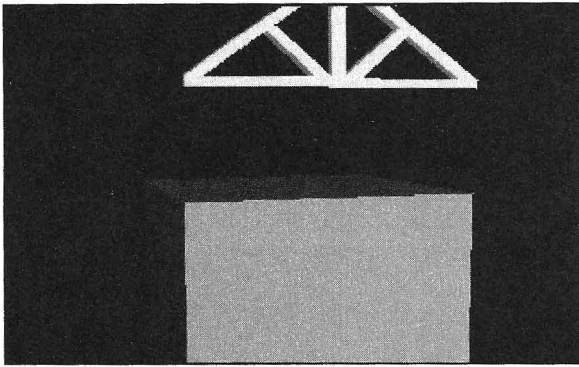
With [T] button on, change color register zero to a yellowish beige by manipulating the RGB sliders.  
The background of all frames is changed to yellowish beige.

Play the flic and save it as TRUSS3D.FLI.

---



*Trusses Are Us Revisited*



*Trusses Are Us Revisited*

**MORE** *Apply any image processing inks or other effects you like. You might, for example, unzag the cube or increase the contrast between colors, shading the truss.*

## **Presenting the 3D Truss Animation**

Once you've polished the joined flic in Animator, you could send it on disk to be loaded inside the Player program. Or you could write a Player script of only one line with the filename TRUSS3D.FLI and its path, if necessary, name the file, and anyone could run the script with Player for an automatic presentation.

To make your animated 3D presentations more interesting, you could make a title frame in Animator and save it as a flic (yes, a flic of just

one frame). Then, in the Player script, the title flic could precede the animation and you could specify a pause of a few seconds for it to be legible. The advantage of this technique is that it eliminates all the frames you'd need to duplicate in Animator to hold the title on screen for the same length of time. For the best results, use the same palette for the title flic as in the 3D animation.

**NOTE** *The Autodesk Animator Reference Manual advises turning GIF files into flic files for Player scripts. GIF files take longer to display and sweep down the screen as they load, an effect that may not be desirable in your presentation.*

The truss animation is deliberately simple. Once you know the procedure for taking AutoCAD models into Animator and on to Player, you'll no doubt create more sophisticated presentations.

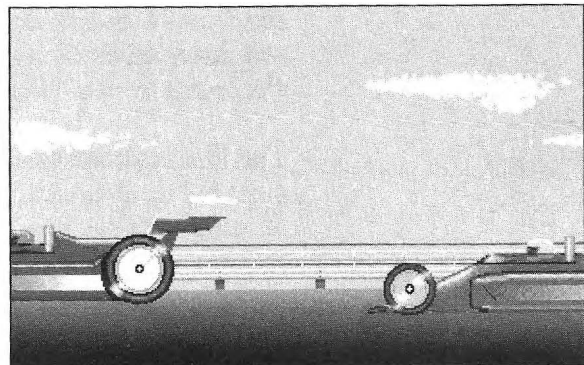
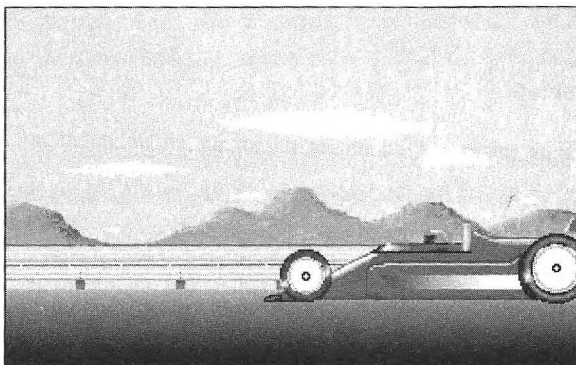
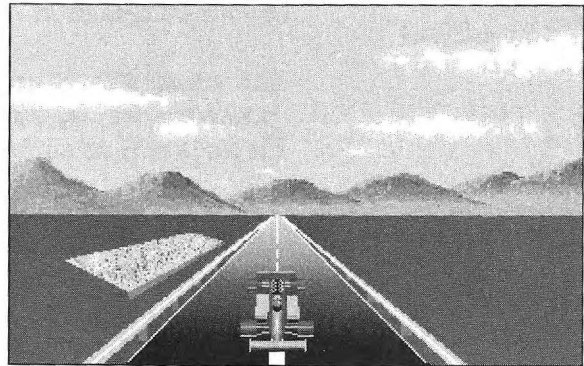
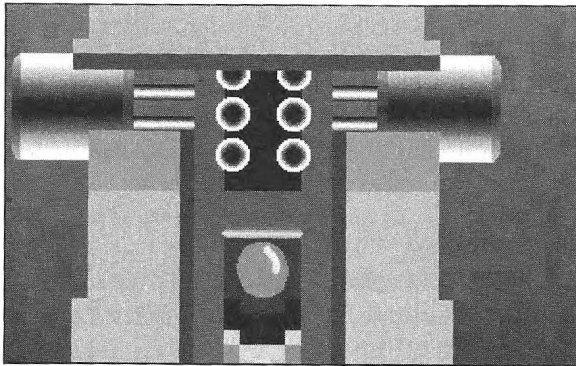
## Other Examples of Presentable Flics

The illustration at the beginning of this chapter is from a presentation created by Amazing Media for Western Digital (copyright Western Digital 1989) designed to play from a Player script. The presentation consists of about 25 short flics pointing out the advantages of the computer hardware devices Western Digital manufactures. The script parameters include pauses, looping a two-frame cycle 23 times, and looping the entire presentation 999 times, in effect making for continuous replaying. The sample of frames from the Amstrad computer animation in Chapter 13 is also an Amazing Media creation that runs from a Player script.

The illustrations in this section are sample frames from several flics suitable for presenting with the Player program. The first is a series of frames from the MTV television channel ID created by Robert Quinn. The next example is from Cap Stock's animation of an architectural walkthrough, illustrating a technique for preparing a preliminary presentation to send to a client. Last is a series of frames from David Nilsen's colorful animation demonstrating the parts of a brake system.

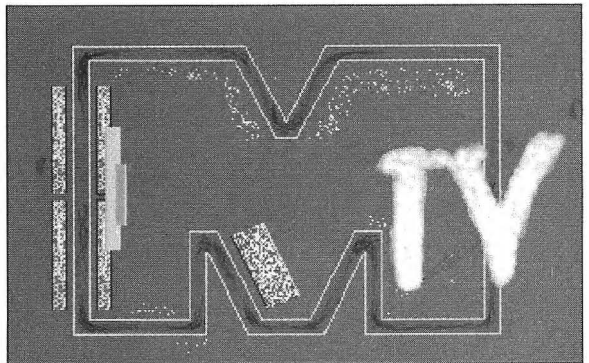
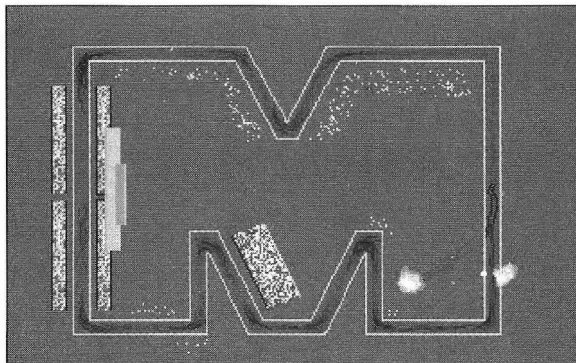
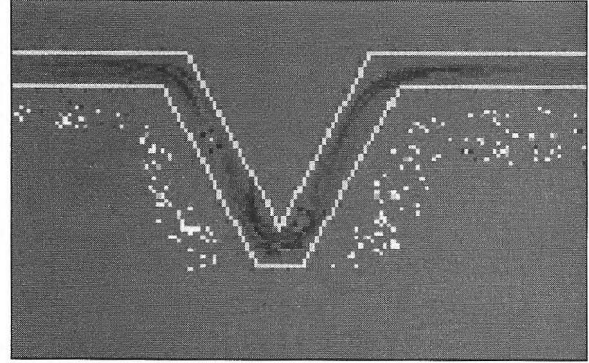
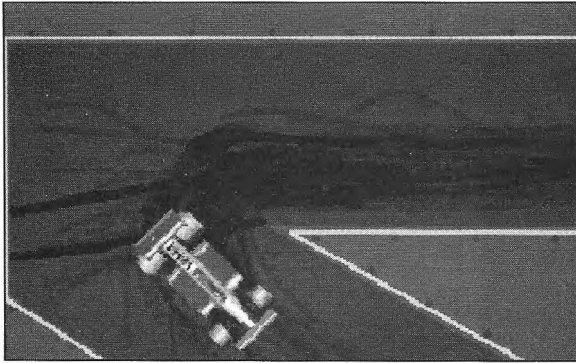
Because of its length and complexity, the MTV animation requires four floppy disks to send to another viewer, each containing one flic. However, once copied to the hard disk, the more than 4 Mb animation can be shown uninterrupted via a simple four-line Player script.

At first, the scale and perspective place the viewer at eye level in one of the race cars careening around the track. In the last moments, the scene shifts to an aerial view, and the viewer looks down on the race course and on the two barely distinguishable race cars. The final frame of the MTV animation, which appears at the beginning of Chapter 9, reveals that the race course is in the shape of the letter “M” and the letters “TV” are formed from the smoke of the two crashed cars. This is truly a design in which the titling has been completely integrated.



*ID for MTV*

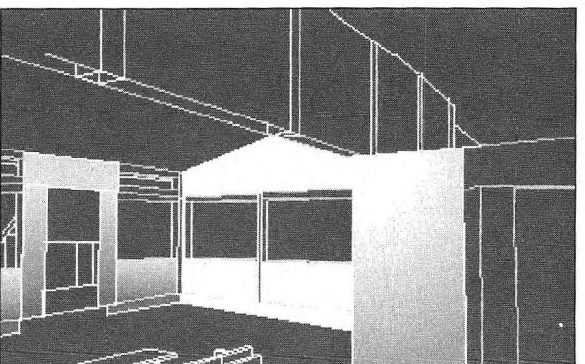
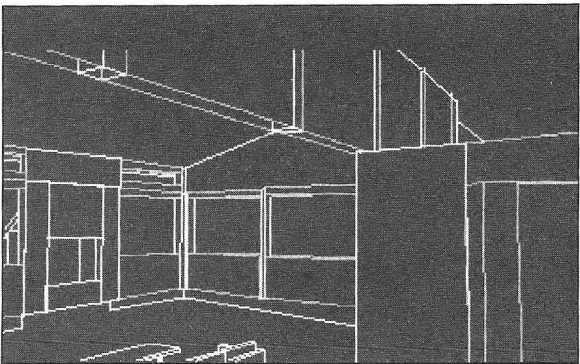
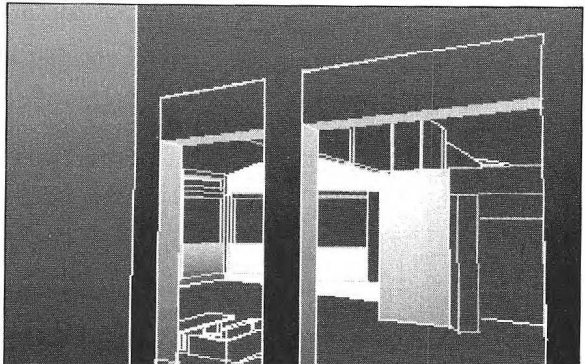
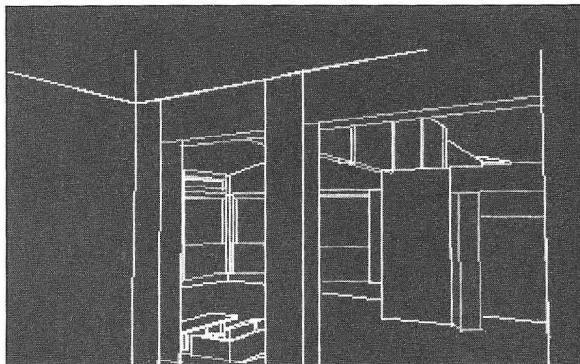
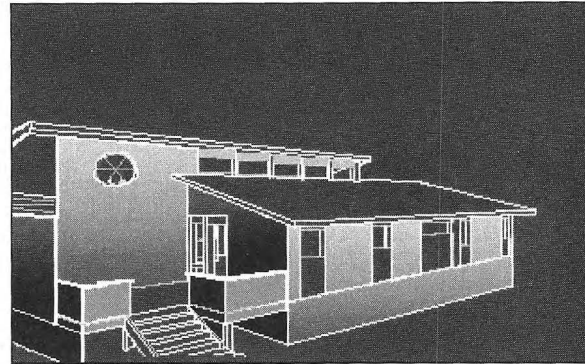
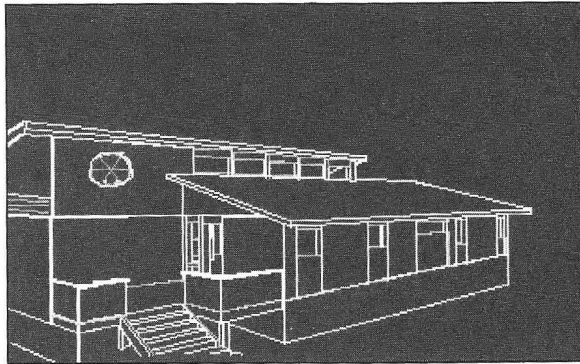




*ID for MTV*

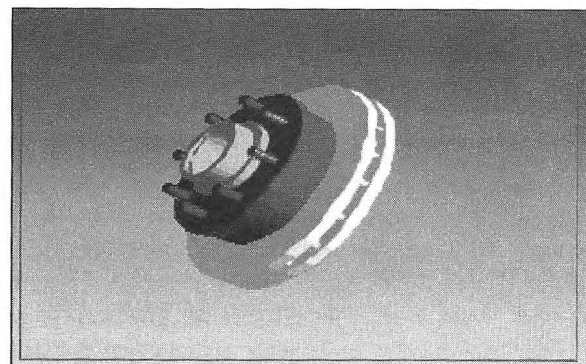
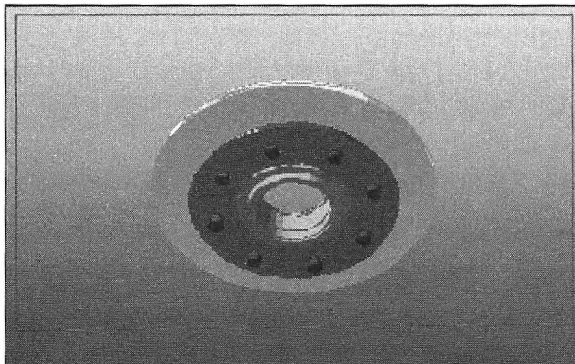
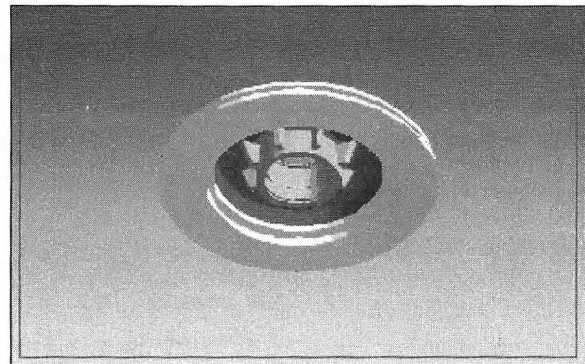
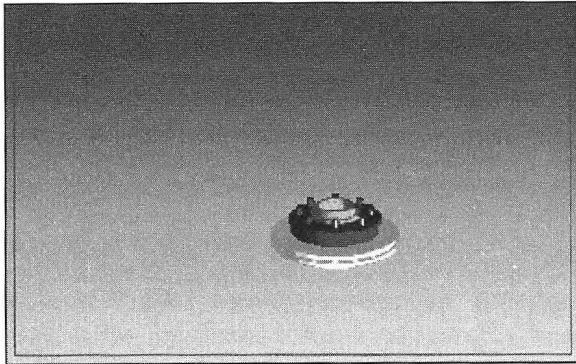
Cap Stocks' house tour, taking the viewer up the stairs and into the living room, was done as a series of AutoCAD wireframe slides. The kinetic paths and the individual slides were created with Architectural Power Tool™ from Caricato Systems of Santa Rosa, California, which produces a slide library presentation for sequentially viewing AutoCAD slides at high resolutions, in addition to making the slides for Flimaker to convert to Animator FLI files.

Each of the three frames shown has been quickly colored in Animator to delineate walls and doors. This technique offers a simpler way to prepare sketches than rendering them in AutoShade.

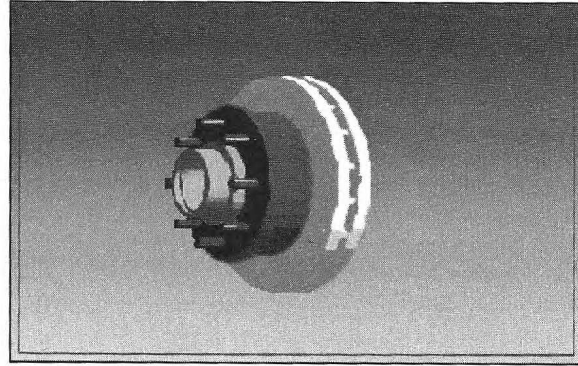
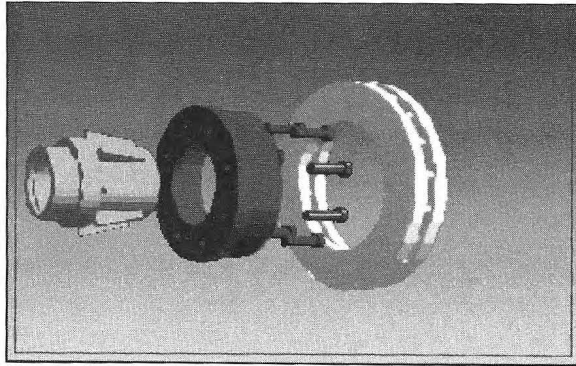


*A Walking Tour*

David Nilsen's animation began as a 3D model in AutoSolid, which was brought into AutoCAD to create the kinetic paths and filmroll files for AutoShade to process. The individual positions were then rendered in AutoShade to create solid shaded images as RND files. The last step was to use Flimaker to convert the RND files to FLI files for showing in Animator. In Animator, optics movements were applied to spin the brake as it moved forward to the center of the screen. A deep blue gradient was applied to the background.



*Braking Up Is Hard to Do*



*Braking Up Is Hard to Do*

## What's Next?

At present, neither Animator nor Player offers any means of coordinating music, sound effects, or voice recordings with your presentations. Using Player's pause parameter, you can interrupt playback in a script to interject commentary, and you can stop and start animations from within the Player program.

To accompany an automatic presentation at a trade show, you may be able to tape music and roughly synchronize it to the action. However, the speed of audio tape varies with the type of tape player involved. Temperature changes can also affect speed of replay. You're hampered in trying to coordinate an audio player with the computer by the inability to lock on a start frame. Probably the most polished results you can achieve are by videotaping the presentation and dubbing sound in the editing phase.

Other programs just coming on the market promise to combine music and other sound effects with Animator. Videotaping presentations also promises to become easier, more reliable, and more coordinated with Animator. See the appendixes for descriptions of current options in these areas.

No doubt Animator itself, in succeeding releases, will fill in some of the present gaps in producing presentations. Soon it should be possible to exhibit fully the visual sophistication and skill you can attain with this program.

# File Formats and File Conversions

The first part of this appendix describes the various formats of the Animator files you can save to keep your project-in-progress organized, and to store parts of a project for possible future use. This appendix discusses options for bringing graphics files into Animator after converting them to the required format, and options for converting Animator picture files and screens to other formats.

## Animator File Formats

When you create a project using Animator, you can save a variety of files. Each type has a distinctive filename extension. The two file types most often saved are GIF and FLIC files.

- *Picture files* (extension .GIF) save the image on one Animator frame along with its RGB values from the 256 slots of that frame's color matrix.
- *Flic files* (extension .FLI) save the graphics data for each frame of an animation, the RGB values for each frame, the play speed setting, optics and titling movements, and fonts and characters for any text.

The other files you can save in Animator are:

- *Cel files* (extension .CEL) save the graphics data for a cel — the image and its background color — and its RGB values.
- *Palette files* (extension .COL) save the RGB values for the displayed frame.
- *Mask files* (extension .MSK) save the mask in the mask buffer.
- *Optics files* (extension .OPT) save all motion settings currently on the optics panel and menus, but do not save paths.

- *Path files* (extension .PLY) save the path movement (spline, polygon, sampled, or clocked) most recently set on the optics panel.
- *Polygon files* (extension .PLY, like path files) save the points of the polygon in the polygon buffer (that is, the shape drawn most recently with one of the tweenable tools).
- *Record files* (extension .REC) save the information to recreate the steps of a macro.
- *Settings files* (extension .SET) save the drive path; all changes from the default settings on the home panel (brush size, zoom factor, which buttons are on or off, and which tools and inks are in the home panel slots); which items on the MASK submenu are selected; which items on the GRID SNAP submenu are selected and the size of any grid; settings for options on the drawings tools panel and on the ink types panel; which buttons on the palette panel are on or off and which slots contain the two clusters; which buttons on the time select panel are on or off; which buttons on the frames panel are on or off and any assigned segment settings; which items on the optics menus are selected, along with any settings on the optics panel; settings for the pixelation special effect; size of the text editing box and its location on screen.
- *Text files* (extension .TXT) save the contents of the text buffer in standard ASCII format.

The last type of file in Animator contains the information to show text in a particular font. While you use *font files* (extension .FNT) in Animator, you cannot create your own fonts or modify the existing font files. You can load font files but cannot save them.

## Importing Files Into Animator

Graphics files from other programs or media that you wish to import into Animator must be in Animator's picture (GIF) or flic (FLI) file format. GIF files with 320 x 200 resolution (the standard CompuServe format and one of the Macintosh GIF formats), can be imported directly. So can text files prepared in other programs in standard ASCII format. Other files must first be converted before they can be brought into Animator.

**TIP** *The richest source of GIF files is CompuServe, where you will find all kinds of artwork in several graphics forums. Check copyrights before*



*incorporating them into your work. For help using CompuServe, see Inside CompuServe from New Riders Publishing.*

Animator supplies a utility program, CONVERT.EXE (known as Converter), that can convert several popular picture formats to Animator's GIF format, including Targa 16 files (TGA), Amiga files (IFF), Deluxe Paint II files (LBM), Atari Neochrome and Degas files (NEO, PI1, PC1) at various resolutions, monochrome MacPaint files (MAC), and PC Paintbrush files (PCX). Converter handles animation files from programs on the Amiga and the Atari. For more information on converting files with Converter, see the appendixes of the *Autodesk Animator Reference Manual* and the README.DOC file that come with Animator.

**NOTE** *You should obtain and use version 1.01 of the Converter program. It removes some limitations of version 1.0. Even so, you may have memory problems if you try to scale very large PCX files, and GIF hand-scanned files with many rows but few columns may not convert correctly. However, you can load such files and capture portions of the image with the slide option.*

*When CONVERT.EXE does color analysis and mapping, it turns the image upside down. It also reads colors from disk, so if you're converting from a file on floppy disk, make sure there's no write-protect tab on it.*

Other programs are commercially available that also convert other formats to GIF format. One that is particularly versatile for desktop publishing is The Graphics Link Plus+ from the Harvard Systems Corp. (Santa Monica, Calif.), which not only converts Deluxe Paint II's fonts into GIF files to bring into Animator, but also converts GIF files into Microsoft Word files (MSP) and Ventura Publisher files (IMG). The Flimaker utility supplied with Animator converts AutoCAD wireframe slide files (SLD) and AutoShade rendering files (RND) to Animator FLI files, as demonstrated in Chapter 14.

Additional file conversion and screen capture programs as well as more information on importing graphics is contained in the document, *Importing Graphics Into Autodesk Animator*, from Autodesk Animator Product Support.

## Scanning In Photographs

The best way to bring photographs of live images into Animator is to first scan them as 35mm slides, and then take the resulting Targa 16 files and convert them to GIF files. This requires fairly expensive professional scanning equipment. At the sacrifice of some quality, readily available hand or desktop scanners can be used to scan photographs. Some scanners include software that directly creates GIF files. Another alternative is to use an adapter that allows a video camera to videotape a slide, and then bring the video image into Animator.

For several illustrations in this book, we converted photographs that had been processed in a CIS•3515 scanner, a professional 35mm scanning system from Barneyscan Corporation. Barneyscan software processing options heightened contrast and cropped the images. A variety of file formats were produced, including 320 x 200 GIF files for the Macintosh, which we were able to import directly into Animator without going through the Converter program. Targa 16 files at 512 x 400 resolution were converted with Converter, using the default 320 x 200 option to scale down the images. Converter color-mapped the GIF files from the much larger Targa palettes. Those photographs with fewer colors (under 15,000) came in most successfully. You can get the CIS•3515 scanner from:

Barneyscan Corporation  
1125 Atlantic Avenue  
Alameda, California 94501  
(415) 521-3388

## Capturing Video Images

With a combination of hardware and software, you can bring live images captured from television, videotape, or video camera into Animator. We tried this with a Jovian VIA Capture Board, capturing a frame of live action with a video camera and with Jovian software, and translating it into a GIF file which was imported directly into Animator. The result was the basis of the image at the beginning of Chapter 1.



Another frame capture board that is also a powerful paint tool, producing Targa 16 files, is the Vision 16 from Vision Technologies, a subsidiary of Everex Systems, Inc.

Jovian VIA  
Video Input Adapter  
Jovian Logic Corporation  
42808 Christy Street, Suite 230  
Fremont, California 94538  
(415) 651-4823

Vision 16  
Vision Technologies  
48431 Milmont Drive  
Fremont, California 94538  
(415) 683-2900

## **Coordinating Music Files**

As we go to press, products are beginning to come out that can coordinate music files with Animator files to add music to your presentations. The near future looks promising for more choices and more features in music programs that will work with your presentations.

One we've been able to try is Talk-Mate, which consists of software and a speech board that can link audio from a tape player or microphone to Animator flics. Because Talk-Mate and other such programs often require installation of their own board to play the results, which are saved in sequence files (SEQ), you cannot use these means to add music to presentations that will be played on other systems.

Another product that has been recently announced is Orchestrator, which promises exact synchronization of images, text, and animation with spoken words, phrases, or moments in a musical score.

Talk-Mate  
Micro-Base Corporation  
884 Pleasant Valley Drive  
Springboro, Ohio 45066  
(800) 922-1360

Orchestrator  
Genesis Development  
15850 West Bluemound Road, Suite 307  
Brookfield, Wisconsin 53005  
(414) 796-1005

## **Capturing Animator Screens**

You have many options for converting Animator screens to files you can print or bring into other programs. Many graphics file conversion programs include screen capture capability. To capture the screens for illustrations in this book, we used Pizazz Plus from Application Techniques, Inc. (Pepperell, Mass.), which converted colors to half-tone gray scale. It is capable of producing files in a number of formats for printing and importing into text and layout software.

# Animator and Videotape

A convenient way to display and circulate Animator presentations is to transfer or *dump* them to videotape. A tape can be mailed to clients and shown on readily available equipment — a VCR and a TV monitor. Because tape playback is not subject to the varying speeds of different computers, you can achieve a standard play speed for your animations and edit at that speed to add music.

The differences between the National Television Standards Committee (NTSC) standard used to encode colors for video display and the VGA display used in your computer require special hardware in order to transfer computer files to videotape. But beyond converting the images so they can be displayed on a television monitor, you want to ensure that your animations will look as good as they can in the different medium.

This appendix explains the main design considerations in preparing Animator graphics to be presented on videotape. It also describes the various tape formats, which can affect the quality of the finished results. At the end is a list of currently available equipment.

## Designing Animations for Videotape

Professional animators working on broadcast-level systems design around the pitfalls of the NTSC standard. Professionals often work on a computer system with a video monitor attached, so that it is immediately apparent how the images will appear when transferred to tape. In addition, colors and images are tested on tape at an early stage. If you're a novice, some trial and error will be inevitable. But some general principles can help you steer clear of disappointments when you see your Animator creations on video. You can design your work to minimize or avoid these common problems:

- *Bleeding colors, especially reds and magentas.* Vibrant reds and magentas on your VGA monitor suffer greatly on video. These colors

bleed, seeping past the boundaries of images into the surrounding area. Lower the saturation level in Animator by adjusting the saturation value (the S slider of HLS) for these colors to cool them down. Choose these colors sparingly and plan where they appear so that they do not bleed onto other images.

- *Flickering horizontal lines.* Single pixel horizontal lines can cause flickering, due to the different methods used to scan the screen horizontally in NTSC versus VGA displays. You must use a fairly thick line to avoid this.
- *Chroma crawl.* Highly saturated colors placed next to one another can produce chroma crawl, or the appearance of a rainbow of colors instead of what you intend. In your design, be careful to combine warm colors with cool colors and, where necessary, lower the saturation by adjusting the saturation value in Animator when the HLS button is selected.
- *Insufficient contrast between adjoining objects.* Insufficient contrast results from colors whose luminance is too close in value. Objects will not “pop out” or be distinct enough. Adjust the saturation value in Animator when the HLS button is selected.
- *Underscanning and borders.* Because the Animator screen is smaller than the video screen, a black border may appear around your pictures on tape, a condition called underscanning. Images that extend to the edge of the Animator screen may seem to be cut off. Some hardware equipment lets you compensate for this by overscanning horizontally, stretching the images. The result, however, may not be desirable, and you may still get a border top and bottom.
- *Fuzziness and blurring.* The NTSC display is not as crisp as the VGA display. Text and straight lines that look all right in Animator are likely to be fuzzy. In some instances, you may want a blurred or fuzzy effect, sort of an extra softening. So long as you are aware of this difference, you can design for it or around it.

Among the sample files in your Animator software is a palette file, NTSC.COL that has been designed to minimize oversaturation and bleeding. You can load this palette before creating your animation and test how it alleviates the conditions described above.

## Videotape Formats

The tape format onto which you transfer your Animator graphics can affect the quality of the results. Videotape comes in a variety of formats:

- 1/2 inch VHS
- 1/2 inch S-VHS (professional and consumer)
- 3/4 inch Betacam
- 3/4 inch Betacam Sp
- 1 inch
- D1 or D2 (digital)

You should always choose the highest quality tape format your budget allows. This is especially crucial for the *master*, the original from which you'll duplicate copies, or *dubs*. The most common format, VHS, which is used in most models of video camera for the consumer (as opposed to professional equipment), offers the poorest quality. Digital tape, D1 or D2 format, is the highest. A compromise for non-professionals is to make the master in S-VHS, which handles RGB transfers much better than regular VHS tape, and to dub down to VHS, because most people don't yet own equipment for playing S-VHS tapes.

## Laying Down Sound Tracks

If you are adding sound to a videotape of an Animator presentation, you'll do so by *dubbing* it (not the same as dubbing or duplicating the videotape itself). To do this, you'll lay down the tracks, or record the sound onto the tape.

Since Animator does not facilitate designing the animation and music together, you're best off making sure that events onscreen do not require exact coordination. Avoid a special sound effect that absolutely must coincide with a particular frame's appearance. Voice narration can work out reasonably well, because speakers naturally pause and phrasing is inherently imprecise. At this point in Animator's development, you cannot achieve precise lip-synched dialogue for your characters.

As noted in Appendix A, new products that add music to Animator computer animations are rapidly entering the marketplace. Soon, PC systems should equal the combined sound and graphics capabilities of the Macintosh and Atari.

### **Hardware for Dumping to Videotape**

A variety of equipment is available for dumping Animator graphics to videotape, and new products are rapidly coming on the market. Any attempt to be exhaustive would be foolhardy. This section lists equipment we are aware of. Asterisks mark the four *video in* boards (for dumping to tape) we have been able to try out.

CGV-10 VGA/NTSC  
Questel, Inc.  
10175 Joerschke Drive  
Grass Valley, California 95945  
(916) 477-5000

COVID 123a Box  
COVID, Inc.  
2400 West 10th Place, Suite #4  
Tempe, Arizona 65281  
(800) 638-6104

Recordable VGA Card and  
Gen Lock Module \*  
US VIDEO  
One Stamford Landing  
62 Southfield Road  
Stamford, Connecticut 06902-9950  
(203) 964-9000

RGB/Videolink Model 600 Scan Converter  
RGB Technologies  
2550 Ninth Street  
Berkeley, California 94710  
(415 ) 848-0971

VGA Producer \*  
Magni System, Inc.  
9500 SW Gemini Drive  
Beaverton, Oregon 97005  
(503) 626-8400

VGA-TV Card  
Willow Peripherals  
190 Willow Avenue  
Bronx, New York 10454  
(212) 402-0010

VIN Box \*  
Jovian Logic, Inc.  
42808 Christy Street, Suite 230  
Fremont, California 94538  
(415) 651-4823

Vision VGA \*  
Vision Technologies  
48431 Milmont Drive  
Fremont, California 94538  
(415) 683-2900

Equipment is rapidly being improved in new features offered. Contact the manufacturers for details, and see the latest revision of the Autodesk Animator product support document entitled *Information Summary For VGA to NTSC Converters*.

# COMPUTER GRAPHICS TRAINING

## 2D/3D GRAPHICS & ANIMATION

*Autodesk Animator  
TOPAS/Crystal3D  
Lumena*

*Rio  
ImagePaint*

## INTERACTIVE MULTIMEDIA

*Hypercard  
Swivel 3D  
CD-ROM*

*Videodisk  
MacRecorder  
Macromind Director*

## DESKTOP PUBLISHING

*PageMaker  
Illustrator 88  
PixelPaint Prof.*

*Quark Xpress  
FreeHand  
Photoshop*

## INTENSIVE WORKSHOPS

*From 1 day to 2 weeks.  
Semester style course also available.*

## EXPERT INSTRUCTORS

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the systems they teach in their daily  
work.*

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you can come to ours!*

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*We can put your animation on  
broadcast quality videotape:*

*Animator & Crystal/Topas animation  
Targa files*

## Give us a call.

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FOR  
ELECTRONIC  
ARTS**



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# Index

2 COLOR  
    options, 3-3  
2D, 7-29, 12-2  
3D, 7-29, 12-2, 14-1, 14-10  
    illusion of, 12-2

---

## A

AA directory, 1-1, 1-3  
AAT directory, 1-19  
ADO effects, 12-2  
Animating a character, 8-2  
Animation  
    character, 8-1  
    classic, 8-1  
    full, 8-3  
    limited, 8-3  
    list, 14-11  
Animation Tool Kit, 14-10  
    menu, 14-17  
ANIMATOR menu  
    BROWSE FLICS, 1-16  
    DRAW TOOLS, 3-2  
    FRAMES, 2-12  
Anti-aliasing, 7-30  
    ink, 3-30  
APPLY INK  
    PIC menu, 3-32  
Architectural walkthrough, 14-30  
ARRANGE menu, 10-5  
    CYCLE, 4-20, 4-23  
ASCII, 14-4, A-2  
AutoCAD, 14-1, 14-10, 14-12, A-3  
    camera positions, 14-12  
    lighting for scenes, 14-12  
AutoCAD slides, 14-11  
AutoFlix, 14-26  
    MOV files, 14-26  
    MVI files, 14-26  
Automatic transitions, 13-22  
AutoShade, 14-1, 14-10, 14-16, A-3  
    batch mode, 14-12  
    configure, 14-12

rendering, 14-22  
rendering frames, 14-21

---

## B

[B] cluster box, 10-5  
BACKWARDS  
    FLIC menu, 7-18  
BELOW  
    CEL menu, 5-11  
Bleeding colors, B-1  
Blending drawings, 11-7  
BLUE FRAME  
    TRACE menu, 8-9  
BLUE NUMBERS  
    EFFECTS menu, 7-26  
Blued image, 8-9  
Box tool, 3-1, 3-3  
    2 COLOR, 3-3, 3-4  
    FILLED, 3-3, 3-4  
Bright ink, 3-29, 3-33  
Browse flics screen, 1-16  
    INFO, 1-16  
    LOAD, 1-16  
    VIEW, 1-16  
Buttons  
    mark, 7-26  
    segment, 7-6  
    TO ALL, 7-7  
    TO FRAME, 7-7  
    TO SEGMENT, 7-7

---

## C

Cel, 2-9, 3-36, 5-1  
    buffer, 2-10, 5-1, 5-7, 5-13, 5-14  
    character, 9-7  
    cleaning up, 5-20  
    clip, 2-10, 12-16  
ELEMENTS menu, 5-16, 7-35  
MOVE, 12-14  
GET, 12-16

- moving, 5-9
- moving on a path, 5-11
- PASTE, 3-18
- pasting, 2-13, 5-9
- pasting over frames, 5-11
- pasting text as, 3-17
- phrase, 9-7
- rotating, 5-13
- selecting, 5-1
- word, 9-7
- CEL files, A-1
- CEL menu, 2-16
- Cell menu
  - 1 color, 10-14
  - BELOW, 5-11
  - CEL files, 2-16
  - CLIP, 5-7, 7-16
  - CLIP CHANGES, 11-7
  - FILES, 5-7
  - GET, 2-10, 5-7
  - MOVE, 5-11, 5-15
  - PASTE, 6-4, 7-16
  - REPEAT CHANGES, 11-7
  - STRETCH, 11-8
  - TURN, 5-13
- Celluloid, 5-1
- Center, 7-35
- CENTER option
  - SIZE, 5-17
  - SPIN, 5-17
- Character animation, 8-1
- Circle wipe, 13-23
- Classic animation, 8-1
- CLEAR
  - PIC menu, 6-11
- CLEAR ALL, 12-17
- PRESETS menu, 7-35
- CLEAR TRACKS, 7-38, 12-17
- CLIP, 10-3
  - CEL menu, 5-7, 7-16
  - MASK menu, 7-9, 7-13
  - SWAP menu, 2-6
- CLIP CHANGES
  - TRACE menu, 8-25
- Clock icon, 12-21
- Clocked path, 12-21
- Cluster, 10-4, 10-10
  - CLUSTER menu, 4-8
  - default, 4-19
  - GET CLUSTER, 4-7
  - gradient, 4-17
  - gradient inks, 3-34
  - LINE CLUSTER, 4-8
  - range of colors, 3-34
  - redefining, 4-7
  - REVERSE, 4-8
  - UNUSED COLORS, 4-8
- Cluster box, 4-2
- palette, 1-10
- CLUSTER menu
  - UNUSED COLORS, 4-27
- Color
  - adjustment, 4-12
  - blue light, 4-11
  - blueing, 7-26, 8-9
  - green light, 4-11
  - light components, 4-11
  - red light, 4-11
  - registers, 4-10
- Color cycling, 4-20, 10-1
- CYCLE, 4-20
- effects, 10-16
- FIT button, 4-21
- industrial illustrations, 10-15
- mechanical illustrations, 10-15
- Color matrix, 4-6, 10-5
  - default color, 5-2
  - default location, 5-2
- Color register zero, 5-2, 5-3
  - changing value, 5-5
- Color replacement
  - HLS slider, 4-11
  - home panel, 4-5
  - interactive, 4-11
  - key color, 4-5
  - matrix slot, 4-8
  - mini-palette, 4-5
  - palette panel, 4-8
  - RGB slider, 4-11
- Color selection
  - clicking, 4-7
  - current color, 4-7
  - <F1> key, 4-4
  - from screen, 4-4
  - home panel, 4-2
  - key color, 4-3
  - mini-palette, 4-3
- Colors
  - copying, 4-23
  - cutting and pasting, 4-23

- number of, 10-4
- total possible, 4-1
- Composite**
  - chopping frames, 13-12
  - cross-fade, 13-6, 13-24
  - functions, 13-6
  - overlay, 13-6
  - underlay, 13-6, 13-11, 13-35
- Compositing**, 4-1, 5-1, 5-3
- Compositing flics**, 13-1
- CONFIGURE**
  - EXTRA menu, 1-13
- Configuring stylus**, 1-4
- CONTINUE MOVE**, 5-19, 12-22
- CONVERT.EXE**, 1-16, 12-25, A-3, A-4
- Coordinates**, status line, 3-8
- Countdown**, 13-3
- CREATE**
  - EXTRA menu, 1-14
  - MASK menu, 7-9, 7-10
- Creating frames for flic**, 2-11
- Creating new text**, 6-2
- Current cluster**, 10-4
- Current color**, 3-33, 4-7
  - slot, 4-1, 4-5
- Cut**, 13-22
- CYCLE**, 8-1, 8-2
  - ARRANGE menu, 4-20, 4-23
- CYCLE DRAW**, 10-6, 10-8
- Cycling**
  - color, 10-1
  - effects of, 10-7

---

## D

- Dark ink**, 3-29, 3-33, 7-41
- Default directory**, 1-21
- Default grid**, 3-7
- DEFAULTFLX file**, 1-20, 2-17, 3-2
- DELETE**, 7-22
- Directory**
  - buttons, 2-16
  - changing, 2-16
- DISPLAY COORDINATES**
  - EXTRA menu, 1-14
- Dissolve**, 13-19, 13-22, 13-42
- Dithering**, 3-30, 3-34, 4-10
- DOS rules**
  - filenames, Animator, 2-15

- Draw tool**, 3-1, 4-21
  - ANIMATOR menu, 3-2
- Drawing**
  - area, 1-12
  - scanning, 11-7
  - straight ahead, 8-8
- Drawing Tools Panel**, 3-1, 6-1
- Drive buttons**, 2-16
- Drive**, changing, 2-16
- Drizzle tool**, 4-21
- Drop shadow**, 5-1, 7-39, 7-41
- Dubbing soundtracks**, B-3

---

## E

- Editing box**, 3-9, 3-13, 3-15, 6-4, 6-7, 6-15
  - moving, 6-5, 6-8
  - resizing, 6-5, 6-7, 6-8
- EFFECTS**
  - EXPAND X2, 11-10
  - FLIC menu, 7-26, 8-29
- EFFECTS menu**
  - BLUE NUMBERS, 7-26
- ELEMENTS menu**
  - CEL, 5-16, 7-35
  - FLIC, 5-16
  - OUTLINE, 12-10
- Ellipsis**
  - Menu, main screen, 1-4
- Emboss ink**, 3-30, 3-31, 3-32, 3-33
- END RECORD**, 9-15
- ERASE GUIDES**
  - TRACE menu, 8-15, 8-17
- Erasing key color**, 2-7
- EXPAND X2**, 11-10
- EXTRA menu**
  - CONFIGURE, 1-13
  - CREATE, 1-14
  - DISPLAY COORDINATES, 1-14
  - GRID, 1-14, 3-6
  - GRID SNAP CONTROL, 3-6
  - GRID SNAP CONTROL, VIEW, 3-6
  - MASK, 7-9
  - RECORD, 9-15
  - SETTINGS, 3-2
  - USE, 1-14
  - VIEW, 1-14

---

**F**

[F] button, 3-3, 3-4, 3-22  
Fade in, 13-1  
Fade out, 13-1, 13-22  
File  
    ASCII text, 6-13, 6-14  
    MSK, 7-9  
    PLY, 11-4  
    settings, 3-2  
    TXT, 6-14  
File selector window, 2-16  
Filenames, Animator  
    DOS rules, 2-15  
    file extension, 2-15  
Files  
    cel, A-1  
    CEL menu, 5-7  
    converting to other formats, A-1  
    filmroll, 14-12  
    flic, A-1  
    font, A-2  
    mask, A-1  
    MOV, 14-26  
    MVI, 14-26  
    numbering sequentially, 2-15  
    optics, A-1  
    palette, A-1  
    path, A-2  
    PIC menu, 2-16  
    picture, A-1  
    polygon, A-2  
    record, A-2  
    reducing size of, 14-8  
    rendering for 3D, 14-12  
    settings, A-2  
    temporary, 1-19  
    text, A-2  
Fill tool, 4-9  
FILLED  
    options, 3-3  
FIT, 10-10  
Flashing screen, 14-6  
FLI files, 1-15  
    FLIC menu, 2-16  
FLIC  
    ELEMENTS menu, 5-16  
Flic files, A-1  
FLIC menu

BACKWARDS, 7-18, 11-5, 12-8  
EFFECTS, 7-26, 8-29  
FLI files, 2-16  
RESET, 1-19  
SHRINK X2, 8-29

**Flics**

dividing, 13-18  
ending with dissolve, 13-42  
new, 13-6  
shrinking, 13-5

**Flimaker, 14-10, A-3**

-C option, 14-25, 14-26  
-V option, 14-25  
animation list, 14-11  
making a flic, 14-24  
play speed option, 14-25

**Flimaker presentations, 14-10****Font files, A-2****Fonts, 6-1, 9-1**

default, 3-7  
sans serif, 9-3  
serif, 9-3  
size, 3-15  
spacing of letters, 9-7

**Frame capture boards, A-4****Frame mode buttons, 7-6****Frame slider bar, 7-22****FRAMES**

Animator menu, 2-12  
inserting and deleting, 7-22

**Frames panel, 2-12**

[\*2] button, 7-24  
[\*3] button, 7-24  
[\*5] button, 7-24  
delete button, 7-22  
[F], 7-42  
insert button, 7-22

---

**G****Gel tool, 4-21****GET**

cel menu, 2-10, 5-7

**GIF files**

line drawings, 1-15  
scanned photos, 1-15

**Glass ink, 3-29, 4-2****Glaze ink, 3-29**

Gradient inks, 1-10, 3-1, 3-34, 4-2, 4-10  
 Gradient ramp, 4-10  
 Graphics  
   forums, A-2  
   importing, A-2, A-4  
 Gray ink, 3-29, 3-33  
 GRID  
   CREATE, 3-7  
   creating, 7-7  
   EXTRA menu, 1-14, 3-6  
   gridsnap, 3-6  
   USE, 3-6, 3-8  
 Grid snap, 3-17

---

## H

H grad ink, 3-30, 3-34  
 Hard Copy option, 14-22  
 HLS, 4-12  
 Hold, 13-46  
 Holding a frame, 7-18  
 Hollow ink, 3-30  
 Home panel, 1-3, 1-7, 3-1  
   default, 1-7  
   moving, 1-12

---

## I

Icon, 3-28  
   brush, size, 1-7  
   brush, slider bar, 1-8  
   brush, toggle, 1-8  
   clock, 12-21  
   frame control, 1-11, 1-18, 2-12  
 IN DISK installing, 1-2  
 IN SLOW, 11-18  
 IN subdirectory, 1-2, 1-3, 2-17  
 Inbetweens, 8-14, 11-2  
 Industrial animations, 8-2  
 Industrial illustration, 10-15  
 Ink selection window, 3-28  
 Ink Types Panel, 3-28  
 Inks, 3-1  
   572 combinations, 3-1  
   anti-aliasing, 3-30  
   bright, 3-29, 3-33  
   CENTER (R GRAD), 4-19

dark, 3-29, 3-33, 7-41  
 DITHER, 3-30  
 emboss, 3-30, 3-31, 3-32, 3-33  
 glass, 3-29, 4-2  
 glaze, 3-29  
 gradient, 1-10, 3-1, 3-34, 4-2, 4-10  
 gray, 3-29, 3-33  
 H grad, 3-30, 3-34  
 hollow, 3-30  
 horizontal gradient, 3-30, 3-34  
 illusion of depth, 3-35  
 INK STRENGTH, 3-30  
 jumble, 3-29, 3-30, 3-33  
 L grad, 3-34  
 line-contour gradient, 3-30, 3-35  
 opaque, 3-1, 3-29, 4-2, 4-21  
 options, 3-30  
 R GRAD, 3-34, 4-19, 4-20  
 radial gradient, 3-35  
 scrape, 2-8, 3-1, 3-29  
 soften, 3-30, 7-31, 9-9  
 spark, 3-29, 3-33  
 split, 3-29, 9-9  
 strength, 3-31, 9-16  
 tile, 3-30, 3-36  
 unzag, 3-30, 7-31, 9-9  
 v grad, 3-1, 3-34, 4-9, 4-21

INSERT, 7-22

INSERT TWEEN

  TRACE menu, 8-15, 8-16, 8-19, 8-23  
 Intermediate position, 8-8

---

## J

Jaggies, 3-30, 7-30  
 Jiffy, 7-21  
 Joining flics, 13-1  
   cut, 13-9  
   dissolve, 13-19  
 Jumble ink, 3-29, 3-30, 3-33  
 Justifying text  
   centered, 6-17  
   DO TITLING, 6-17  
   filled, 6-17  
   left, 6-17  
   right, 6-17

---

**K**

- [K] button, 5-2, 9-11
- Key
  - delete, 6-4
- Key color, 4-2, 5-1, 5-2, 5-3, 13-11, 13-16, 13-28, 13-33
  - changing, 5-5
  - erasing, 2-7
- Key poses, 8-1, 8-14
- Keyboard shortcuts
  - initial, 1-5
  - single-key, 1-6
- Keys
  - text editing, 6-8

---

**L**

- L grad ink, 3-34
- Layout, 12-8, 13-8
  - moving elements, 2-2
  - moving elements in, 9-1
  - spatial design, 2-2
- Leaving a Frame
  - UNBLUE FRAME, 8-12
- Leaving Animator, 1-18
- Line drawings, 5-1
  - GIF files, 1-15
- Line-contour gradient
  - ink, 3-30, 3-35
- Line tool, 3-4, 3-5, 3-9
- LOAD TEXT
  - Titling panel, 6-14
- LOOP SEGMENT
  - TRACE menu, 7-20

---

**M**

- [M] button, 10-4
- Macros, 9-15
  - END RECORD, 9-15
  - REALTIME RECORD, 9-15
  - record, 9-15
  - START RECORD, 9-15
  - using, 9-17
- Main screen
  - displaying, 1-12

- menu, 1-3, 1-4
- MASK, 10-3
  - EXTRA menu, 7-9
- mask buffer, 7-9
- Mask files, A-1
- MASK menu
  - CLIP, 7-9, 7-13, 10-3
  - CREATE, 7-9, 7-10
  - INVERT, 10-3, 10-4
  - MSK files, 2-16
  - RELEASE, 7-12
  - VIEW, 10-3
- Masking
  - creating, 7-9
- Maximum tint percent
  - VALUE menu, 4-15
- Mechanical illustrations, 10-15
- Menu, main screen, 1-3, 1-4
  - ellipsis, 1-4
- Menu, selecting, 1-3, 1-5
- Metamorphosis, 3-20, 3-25, 11-1
- Mini-palette, 4-2
- Mode button, 1-8
  - [F], 1-8, 1-9
  - [K], 1-8, 1-9
  - [M], 1-8, 1-9
  - [T], 1-8, 1-9
- Motion
  - kinetic, 14-15
  - paths, 8-3, 14-15
- Mouse
  - control buttons, 12-4
  - right clicking, 1-3
- Move tool, 3-9, 9-7, 9-11
- MOVE, 7-28, 7-36, 12-4, 12-6
  - CEL menu, 5-11, 5-15
  - CONTINUE, 12-22
- MOVEMENT, 7-36
- MOVEMENT menu
  - IN SLOW, 12-13
  - OUT SLOW, 12-13
- Moving elements, 8-2
- MSK files
  - MASK menu, 2-16
- Music, 7-19, B-3
  - coordinating animation with, A-5

---

**N**

National Television Standards  
Committee, B-1  
NEW TEXT  
  Titling panel, 6-15  
NEXT BLUE  
  TRACE, 8-8  
  TRACE menu, 8-9, 8-10, 8-13, 8-19,  
    8-23, 8-33  
NTSC, B-1

---

**O**

ONE PALETTE, 14-26  
Opaque ink, 3-1, 3-29, 4-2, 4-21  
Optical effects  
  creating, 12-1  
Optics files, A-1  
Optics menu bar, 7-27  
Optics motion, 5-16  
Optics movements  
  automatic, 12-2  
Optics panel, 7-9, 7-28  
  CENTER, 5-16  
  path, 5-11  
  PRESETS menu, 12-2  
  slider bars, 12-4  
  SPIN, 5-16  
  SPIN TURNS option, 13-39  
Options  
  2 COLOR, 3-3  
  FILLED, 3-3  
  tools, 3-31  
OUT SLOW, 11-18  
Oval tool, 3-3, 11-3

---

**P**

Pacing, 7-1, 7-18  
Palette  
  combining, 4-26  
  creating single, 14-26  
  default, 4-17  
  files, A-1  
  keep current color, 13-6  
  menu, 4-26, 14-26

  menu bar, 10-5  
  organizing, 4-16  
  palette (COL) file, 4-18  
  PALETTE menu, 4-26  
  squeeze, 4-26  
PALETTE menu  
  CYCLE DRAW, 4-23, 10-6  
  ONE PALETTE, 4-26  
Palette panel  
  ALL, 4-14  
  CLUSTER, 4-14  
  FIT, 4-14  
Palettes  
  combine color maps, 13-4  
  combining, 13-4  
  keep current color, 13-4  
  no fitting, 13-4  
  use overlay color, 13-4  
PASTE  
  SWAP menu, 2-6  
  CEL, 3-18  
  CEL menu, 6-4, 7-16  
Pasted text, clipping, 6-4  
Pasting a cel, 2-13  
Path, 12-4, 12-7  
  describing, 5-15  
  OPEN, 5-17, 12-17  
  SPLINE, 5-17, 12-17  
Path files, A-2  
Pauses, 7-18  
Petal tool, 3-3, 11-3  
Photographs, scanning, 11-7, A-4  
PIC  
  RESTORE, 2-8  
PIC menu, 13-36  
  APPLY INK, 3-32  
  CLEAR, 6-11  
  FILES, 2-16  
  RESTORE, 6-11  
  saving files, 2-16  
  SEPARATE, 3-18, 6-11, 8-19  
  UNDO, 6-11  
  VIEW, 1-12  
Picture files, A-1  
Picture formats, A-3  
PING PONG, 7-38  
Play speed, 7-18, 7-20, 13-3  
  standardized, 13-3  
Play speed bar  
  default setting, 7-20

- Player, 14-1, 14-2
  - keyboard alternatives, 14-3
  - menu bar, 14-2
  - menus, 14-2
  - screen, 14-2
  - scripted animations, 14-3
- Player parameters, 14-6
  - loop, 14-7
  - pause, 14-7
  - speed, 14-7
  - transition, 14-7
- Player program, 13-3
- Playing a flic, 1-18
- Points
  - matching for polymorphic tweening, 11-5
- Poly tool, 3-3, 3-4, 3-21, 4-2, 11-3, 11-4
- Polygon
  - current, 11-5
  - end, 11-5, 11-14
  - start, 11-5, 11-13
- Polygon buffer, 11-4
  - optics move, 11-4
  - reuse option, 11-4
  - tween option, 11-4
- Polygon file, 11-4, A-2
- Polygons, 3-20, 11-3
  - closed, 3-21
  - end, 11-3, 11-7
  - file, 3-25
  - filled, 3-22
  - oval, 3-20
  - petal, 3-20
  - poly, 3-20
  - preparing for tweening, 11-12
  - rpoly, 3-20
  - shape, 3-21
  - spiral, 3-21
  - spline, 3-21
  - star, 3-21
  - start, 11-3, 11-7
- Polymorphic tweening, 11-1
  - matching points, 11-5
  - preparing drawings, 11-7
  - preparing polygons, 11-12
  - preparing the end polygon, 11-14
  - preparing the start polygon, 11-13
- Presentations
  - automated, 14-1, 14-10

- PRESETS menu, 12-3
  - CLEAR ALL, 7-35, 12-17
  - PULL BACK, 7-27, 12-2
  - SPIN, 12-2, 12-3
  - SPIN SMALL, 12-2, 12-3
  - SQUASH, 12-2
  - TWIRL, 12-2, 12-3
  - WHIRL, 12-2, 12-3
- PREVIEW, 6-20
- Previewing motion, 2-14
- PULL BACK, 12-2
  - PRESETS menu, 7-27

---

## Q

- Quitting program, 1-18

---

## R

- R GRAD ink, 3-34, 4-19, 4-20
- Radial gradient ink, 3-35
- RAM disk, 1-18
- RAMP, 10-5
  - VALUES menu, 4-17
- ramping, 4-17
- Range box, 7-23
- RDVGA.EXE, 14-22
- REALTIME RECORD, 9-15
- Record files, A-2
- Record option, 14-22
- Recycling Characters, 8-24
- REDUCE, 13-26
- Register zero, 13-33
- Registered elements, 13-20, 13-24
- RELEASE
  - MASK menu, 7-12
- RENDER, 6-20, 8-19
- Rendering
  - a cel, 2-14
  - AutoShade, 14-21
  - file format, 14-22
- REPEAT MACRO, 9-15
- RESET
  - FLIC menu, 1-19
- Resetting Animator, 1-19
- Resolution, A-2
- RESTORE
  - PIC, 2-8



PIC menu, 6-11  
 REVERSE, 5-11, 6-15, 6-20  
 RGB, 4-10  
 Right dragging, 7-4  
 Rotating  
   CEL, 5-13  
 Rpoly tool, 11-3

## S

Sans serif fonts, 9-3  
 Saving Files  
   PIC menu, 2-16  
 Scanned images, 8-2  
 Scanned photos, 3-27, 5-1, 5-19  
   GIF files, 1-15  
 Scanning, A-4  
   drawings, 11-7  
   photographs, 11-7  
 Scrape ink, 2-8, 3-1, 3-29  
 Screen capture, A-3, A-6  
 Script, 14-1  
 Scrolling text, 6-15, 6-18  
 Segment, 7-1  
 Segment Bar, 7-3, 7-4, 7-23  
 Segment buttons, 7-6  
 SEGMENT FLIP  
   TRACE menu, 7-20  
 SEPARATE  
   PIC menu, 3-18, 6-11, 8-19  
   tool, 4-9  
 Sequential numbering  
   files, 2-15  
 Serif fonts, 9-3  
 Setting # of frames, 2-12  
 SETTINGS  
   EXTRA menu, 3-2  
 Settings files, A-2  
 SHADERFILE, 14-22  
 Shape tool, 5-19, 8-25, 11-3  
 Shortcuts, keyboard  
   initial, 1-5  
   single-key, 1-6  
 SHRINK X2  
   FLIC menu, 8-29  
 Shrinking flics, 13-5  
 SIZE, 12-4, 12-6, 13-26  
   CENTER option, 5-17  
 SIZE CENTER, 12-4

Slides  
   AutoCAD, 14-1, 14-11  
 Soften ink, 3-30, 7-31, 9-9  
 Sound, B-3  
 Soundtracks, dubbing, B-3  
 Spark ink, 3-29, 3-33  
 SPIN, 12-2, 12-3, 12-4  
   CENTER option, 5-17  
   TURNS, 5-19  
 SPIN AXIS  
   default setting, 12-5  
 SPIN CENTER, 12-4  
   default setting, 12-4  
 SPIN SMALL, 12-2, 12-3  
 SPIN TURNS, 12-5, 13-39  
 Spiral tool, 3-9, 11-3  
 Spline tool, 3-21, 11-3, 11-4  
 Split ink, 9-9, 3-29  
 Spray tool, 3-1  
 SQUASH, 12-2  
 SQUEEZE  
   VALUE menu, 4-27  
 Staircase result, 3-30  
 Star tool, 11-3  
 START RECORD, 9-15  
 Starting Animator, 1-3  
 Starting position, 8-8  
 Statusline, 1-13, 5-13  
   color register number, 4-13  
   RGB value, 4-13  
 STILL  
   Titling panel, 6-12  
 Storyboard, 2-2, 7-2, 12-8, 13-2, 13-8  
 Straight ahead, 8-1  
 Strength, ink, 3-31  
 Stylus, 1-3, 1-4  
 SWAP menu  
   CLIP, 2-6  
   PASTE, 2-6  
   swap buffer, 2-6  
   TRADE, 2-6  
   VIEW, 2-6  
 Swap screen, 2-6, 2-8, 7-16, 8-6  
 Swap screen buffer, 2-19  
 SYSTEM.FNT, 3-7

---

**T**

- [T] button, 2-13, 6-4, 6-12, 7-31, 7-42, 8-19, 8-22, 10-10, 10-11, 13-36
- Technical illustrations, 10-15
- Television, A-4
- Text
  - buffer, 6-2, 9-6
  - creating, 6-4
  - editing, 6-6
  - justifying, 6-17
  - legibility, 13-3
  - scrolling, 6-15, 6-18
  - time onscreen, 13-3
- Text cursor, 3-14
- Text file (TXT), 6-2
- Text files, A-2
- Text tool, 3-4, 3-9, 3-13, 4-21, 6-1, 9-5
  - EDIT, 6-2, 6-6
  - FONT, 6-2, 6-11
  - LOAD, 6-2
  - PLACE WINDOW, 6-9
  - REUSE, 6-2, 6-6, 6-9
  - right clicking on, 6-2
  - SAVE, 6-2, 6-13
  - tweening, 3-20
- Three-dimensional illusions, 12-2
- Tile ink, 3-30, 3-36
- Time select button, 6-20
- Time select panel, 6-20, 7-9, 7-29, 7-38, 8-19
- Timing, 7-1, 7-18
  - film, 7-19
  - slow in, 7-37
  - slow out, 7-37
  - videotape, 7-19
- TINT, 10-11
  - VALUE menu, 4-15
- Tinting, 4-14, 4-15
  - FIT, 4-14
  - illusions, 4-16
- Titles, 9-1
  - fonts, 9-1
  - legibility, 9-1
- Titling menu
  - EDIT TEXT, 6-7
- Titling option
  - SCROLL UP, 6-20
- Titling panel, 6-3
  - DO TITLING, 6-3, 6-15, 6-20
  - EDIT TEXT, 6-3
  - LOAD FONT, 6-3, 6-11
  - LOAD TEXT, 6-14
  - NEW TEXT, 6-3, 6-15, 6-18
  - options, 6-1
  - PLACE WINDOW, 6-3
  - scroll across, 6-15
  - scroll up, 6-15
  - STILL, 6-12
  - type on, 6-15
- Tool selection window, 3-2
- Tools, 3-1
  - text options, 6-2
  - 2 COLOR, 8-25
  - 572 combinations, 3-1
  - box, 3-1, 3-3, 3-9
  - default, 3-1
  - draw, 3-1, 4-21
  - drizzle, 4-21
  - fill, 4-9
  - gel, 4-21
  - line, 3-4, 3-5, 3-9
  - move, 3-9, 9-7, 9-11
  - near option, 13-36
  - options, 3-3, 3-31
  - oval, 3-3, 11-3
  - petal, 3-3, 11-3
  - poly, 3-3, 3-4, 3-21, 4-21, 11-3, 11-4
  - replacing, 3-5
  - rpoly, 11-3
  - separate, 3-18, 3-19, 4-2, 4-9, 13-36
  - shape, 5-19, 8-25, 11-3
  - spiral, 3-9, 11-3
  - spline, 3-21, 11-3, 11-4
  - spray, 3-1, 3-4, 4-21
  - spray, options, 3-4
  - star, 11-3
  - status line, line tool, 3-9
- Total frames box, 2-12, 7-23
- TRACE menu
  - BLUEFRAME, 8-9
  - CLIP CHANGES, 8-25
  - ERASE GUIDES, 8-15, 8-17
  - INSERT TWEEN, 8-10, 8-15, 8-16, 8-19, 8-23
  - LOOP SEGMENT, 7-20
  - NEXT BLUE, 8-8, 8-9, 8-10, 8-12,

8-13, 8-19, 8-23, 8-33, 13-46  
 SEGMENT FLIP, 7-20  
 UNBLUE FRAME, 7-26, 8-9  
 UNBLUEFRAME, 8-13  
 TRADE  
   SWAP menu, 2-6  
 Transitions  
   automatic, 13-22  
   circle wipe, 13-23  
   default number of frames, 13-23  
   dissolve, 13-22, 13-23  
   fade out, 13-22  
   venetian, 13-22  
   wipe, 13-22  
 TURN  
   CEL menu, 5-13  
 Tweenable, 3-20  
 Tweening, 11-1, 11-3  
   matching points, 11-5  
   polymorphic, 3-20  
   preparing drawings, 11-7  
   preparing polygons, 11-12  
   preparing the end polygon, 11-14  
   preparing the start polygon, 11-13  
   setting positions for, 3-23  
 TWEENING OPTIONS menu  
   ADJUST END, 11-17  
   ADJUST START, 11-17  
   DO TWEEN, 11-17  
   END TO START, 11-17  
 TWEENING OPTIONS menu,  
   3-21, 3-23  
 TWIRL, 12-2, 12-3  
 Two-dimensional images, 12-2

---

## U

UNBLUE FRAME  
   TRACE menu, 7-26, 8-9, 8-13  
 UNDO, 2-8, 3-13  
   PIC menu, 6-11  
 UNUSED COLORS  
   CLUSTER menu, 4-27  
 Unzag ink, 3-30, 7-31, 9-9  
 USE  
   EXTRA menu, 1-14  
 USE MACRO, 9-15

---

## V

V grad ink, 3-1, 3-34, 4-9, 4-21  
 VALUE menu  
   maximum tint percent, 4-15  
   RAMP, 4-17, 10-5  
   SQUEEZE, 4-27  
   TINT, 4-15  
   tint strength, 4-15  
 Venetian, 13-22  
 Video in boards, B-4  
 Videotape, A-4  
   bleeding colors on, B-1  
   blurring on, B-2  
   chroma crawl on, B-2  
   dubbing, B-3  
   dumping to, B-1  
   formats, B-1, B-3  
   fuzziness on, B-2  
   insufficient contrast on, B-2  
   master, B-3  
   oversaturation on, B-2  
   transferring files to, B-1  
   underscanning on, B-2  
 VIEW  
   EXTRA menu, 1-14  
   SWAP menu, 2-6

---

## W

Walk cycle, 8-2, 8-14, 8-34  
 Walkthrough, 14-30  
 WHIRL, 12-2, 12-3  
 Window file selector, 2-16  
 Wipe, 13-22  
 Wipe on, 13-1  
 WIREFRAME, 5-17, 7-27, 14-1  
   animations, 14-11  
 Write on, 13-46  
   creating, 7-8

---

## Z

Zoom button  
   magnification factor, 1-9  
   zoom box, 1-9

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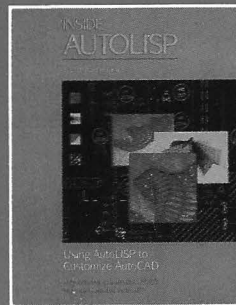
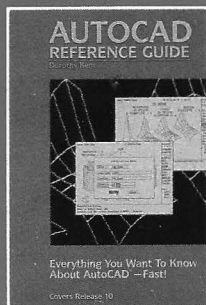
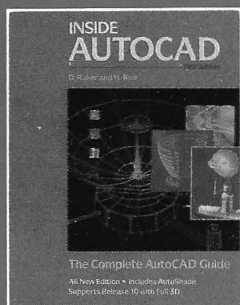
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